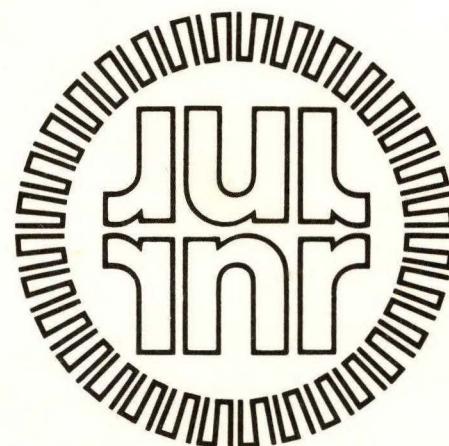


Thesis/
Reports
Cortner,
H. J.

REGIONAL DESCRIPTION OF THE
SOCIAL, ECONOMIC, AND POLITICAL ASPECTS
OF THE CORONADO NATIONAL FOREST



School of Renewable Natural Resources
University of Arizona

LIBRARY

FEB 27 1979

ROCKY MOUNTAIN STATIC

REGIONAL DESCRIPTION OF THE
SOCIAL, ECONOMIC, AND POLITICAL ASPECTS
OF THE CORONADO NATIONAL FOREST

Prepared in cooperation with the Coronado National Forest,
and the Surface Environment and Mining Program (SEAM), U.S.D.A.
Forest Service, under Cooperative Research Agreement #16-855-CA (SEAM)

February, 1979

ADDENDA

Page II-38, Paragraph 4, Line 5, add:

The reference for participant profiles shown in Tables II-12
and II-3 is Garcia, 1978.

Page II-42, add:

Source of data: Garcia, 1978.

Page II-43, add:

Source of data: Garcia, 1978.

Page II-60, add:

Garcia, Margot. 1978. Unpublished data based on a research
project conducted while at the School of Renewable Natural
Resources, University of Arizona, Tucson, January to July, 1978.

PROJECT PERSONNEL

Principal Investigators

Hanna J. Cortner, School of Renewable Natural Resources, Project Director

Edwin H. Carpenter, Department of Agricultural Economics

Dennis C. Cory, Department of Agricultural Economics

Research Staff

Scott J. Ullery, School of Renewable Natural Resources

Keith Menzie, Department of Agricultural Economics

Eric L. Lundgaard, Department of Agricultural Economics

Coronado National Forest Liaison-Coordinator

Merton T. Richards, School of Renewable Natural Resources

Coronado National Forest Planning Group Member

TABLE OF CONTENTS

| | |
|--|--------|
| I. Introduction | I-1 |
| II. Summary of Major Resources and Resource Demand | II-1 |
| Introduction | II-1 |
| Resources of the CNF | II-1 |
| Mineral Resources | II-1 |
| Renewable Forest Resources | II-8 |
| Recreation Resources | II-28 |
| The Demands for Coronado National Forest Resources | II-35 |
| The Public Involvement Program | II-35 |
| Uses for CNF Resources Identified Through the Public Involvement Program | II-39 |
| Competing Demands for CNF Resources: Issues Identified Through the Public Involvement Program | II-46 |
| Conclusion | II-46 |
| Notes | II-56 |
| Glossary | II-59 |
| References Cited | II-60 |
| III. A Socioeconomic and Political Overview of the CNF | |
| Human Resource Unit | III-1 |
| Introduction | III-1 |
| Purpose of this Overview | III-1 |
| Expected Utility of the Overview | III-2 |
| Data Sources | III-2 |
| Definition of the Study Area | III-4 |
| The Human Resource Unit (HRU) | III-4 |
| A Basic Description of the Coronado National Forest's Human Resource Unit | III-7 |
| The Land and Its Administration | III-7 |
| Population | III-9 |
| Some Social Characteristics of the Population | III-13 |
| The Economy | III-16 |
| The Polity: The Institutional Framework of the CNF HRU | III-25 |
| Introduction | III-25 |
| Governmental Organizations in the CNF HRU | III-25 |
| Private Interest Groups in the CNF HRU | III-38 |
| Political Structure of the CNF HRU in Perspective | III-42 |
| Current Natural Resource Issues in Arizona and New Mexico | III-43 |
| Current Planning Efforts | III-46 |
| References Cited | III-50 |
| IV. Issue Scenarios | IV-1 |
| Future Demand | IV-1 |
| Structure of Scenarios | IV-2 |
| V. Summary and Analysis of Discussions With CNF District Rangers . . . | V-1 |
| Objectives of the Discussions | V-1 |
| The District Ranger as Politician | V-1 |
| The Discussion Format | V-3 |
| Discussion Summaries and Analyses | V-3 |
| Current and Future Management Situations | V-3 |
| Relationships with the Outside Community and with Important Constituency Groups | V-6 |

| | |
|--|------|
| Needs for Socioeconomic and Political Information | V-7 |
| Decision-Making Strategies and Patterns | V-8 |
| References Cited | V-9 |
| Discussion Topics | V-10 |
| VI. Evaluating Alternative Uses of Forest Resources: A Suggested Utilization Methodology For Integrating Socioeconomic-Political Information Into Planning and Decision-Making | VI-1 |
| Introduction | VI-1 |
| Allocative Efficiency | VI-1 |
| Distributive Equity | VI-3 |
| Political Feasibility | VI-5 |
| Conclusion | VI-6 |
| Notes | VI-6 |
| References Cited. | VI-7 |

LIST OF FIGURES

| | Page |
|--|--------|
| II-1 Mining Districts within the Coronado National Forest. | II-4 |
| II-2 General Mineral Locations in the Catalina Ranger District | II-10 |
| II-3 General Mineral Locations in the Nogales Ranger District | II-11 |
| II-4 General Mineral Locations in the Sierra Vista Ranger District | II-12 |
| II-5 General Mineral Locations in the Douglas Ranger District. | II-13 |
| II-6 General Mineral Locations in the Safford Ranger District. | II-14 |
| II-7 Grazing Allotments in the Catalina Ranger District. | II-21 |
| II-8 Grazing Allotments in the Nogales Ranger District | II-24 |
| II-9 Grazing Allotments in the Sierra Vista Ranger District. | II-25 |
| II-10 Grazing Allotments in the Douglas Ranger District | II-26 |
| II-11 Grazing Allotments in the Safford Ranger District | II-27 |
| III-1 Coronado National Forest HRU. | III-6 |
| III-2 Arizona Congressional Districts | III-29 |
| III-3 New Mexico Congressional Districts. | III-30 |
| III-4 1978 Arizona Legislative Districts. | III-34 |
| VI-1 Efficient Allocation of Forest Acreage. | VI-2 |
| VI-2 Allocations Modified by Distributive Equity Considerations. | VI-4 |

LIST OF TABLES

| | |
|---|-------|
| II-1 Historical Production of Various Mining Districts Through 1970. . . | II-5 |
| II-2 Summary Table (Mining). | II-9 |
| II-3 Timber Harvest Schedule | II-16 |
| II-4 Timber Inventory. | II-17 |
| II-5 Grazing Allotments. | II-18 |
| II-6 Wildlife Report | II-19 |
| II-7 Surface Runoff Data for the Coronado by District. | II-22 |
| II-8 Recreational Use. | II-30 |
| II-9 Recreational Use of the Coronado Forest by District | II-31 |
| II-10 A Profile of Groups Solicited by Mail to Participate in the Total Forest Land Management Plan | II-40 |
| II-11 Public Participation Forums--Locations and Attendance | II-41 |
| II-12 Notification, Self-Identification, and Race of Forum Participants . | II-42 |
| II-13 Self-Identified Forest Users by Forum | II-43 |
| II-14 Major Uses Identified | II-44 |
| II-15 Top Uses by Forum | II-45 |
| II-16 Forest Issues Identified for Land Management Planning | II-47 |
| II-17 Issue Rankings for Each Forum | II-49 |
| II-18 Forum Participants' Ranking of Mining Issues. | II-51 |
| II-19 Future and Ideal Realities Identified by Forum Participants | II-52 |

| | Page |
|--|--------|
| III-1 HRU Land Status | III-8 |
| III-2 Population of HRU Counties, 1960-1977 | III-10 |
| III-3 Projected Population for HRU (Arizona Counties only), 1978-2000. | III-11 |
| III-4 Population and Average Annual Percent Growth Rate, Selected HRU Communities, 1960-1977. | III-14 |
| III-5 Racial Distribution for Arizona Counties. | III-15 |
| III-6 Income Levels for Arizona Counties. | III-16 |
| III-7 Historic and Projected Employment Patterns, 1971-2000 | III-20 |
| III-8 Federal Agencies with Responsibilities for Natural Resources and Land Use. | III-26 |
| III-9 Arizona State Agencies with Responsibilities for Natural Resources and Land Use. | III-32 |
| III-10 New Mexico State Agencies with Responsibilities Related to Natural Resources and Land Use. | III-33 |
| III-11 Party Affiliations of Arizona State Legislators in the CNF HRU. | III-36 |
| III-12 Interest Groups of Current or Potential Concern to the CNF. | III-39 |

I. INTRODUCTION

While social impact assessments are now included as part of the supporting documents accompanying all major Forest Service decisions, the quality of the data in such documents has often been found lacking. Frequently, for example, only one social consequence--the economic impact--is emphasized, while the impact of agency plans and programs on the human community as a system is overlooked. Moreover, the implications of change in social variables are often not thoroughly explored or discussed. Most importantly, forest managers have encountered difficulties in actually translating social impact data into useable information and integrating that information into planning and decision-making.

The Forest Service recognizes the need to improve techniques to develop and apply socioeconomic and political considerations into broad land management planning. Indeed, proposed resource planning regulations drafted pursuant to the National Forest Management Act specifically mandate an interdisciplinary planning approach in order to develop understanding of the complex of factors--physical, biological, economic, and social--that enter into the resource planning process and to ensure consideration of all resources and how their management affects public health and welfare. The Coronado National Forest, which has been designated a "lead" forest to test the proposed planning regulations of the National Forest Management Act, has been particularly concerned that its land management plan overcome some of the past deficiencies of social impact assessment. It has sought assistance in developing innovative methods to process socioeconomic-political information and to integrate that information into planning and decision-making.

An interdisciplinary team of social scientists--political scientists, economists, and a sociologist--at the University of Arizona has been working with the CNF in the development of its land management plan. This socioeconomic technical work group has sought to provide assistance to the CNF by (a) identifying future resource concerns, issues and opportunities; (c) identifying the kind of management information that is required to resolve various issue scenarios; and (d) suggesting the initial outline of a methodology to integrate such information and analyses into planning and decision-making. In addition, the UA group has sought to examine the Human Resource Unit (HRU) concept developed by the Forest Service's Surface Environment and Mining Program (SEAM) for its applicability to forest-wide land management planning. The HRU concept proposes to define within geographical boundaries the agencies and groups which will affect, or be affected by, forest management. A chief criterion of the HRU is the tendency of the people in the social impact assessment area to act as if they were a single community, working together to identify and resolve issues through a cooperative, coordinative planning process.

To accomplish these related, yet diverse objectives, this document is comprised of six discrete units including the introduction, each of varying utility to the individual reader. For some, the entire package will serve as a coherent summary of the Coronado National Forest "setting." Others may only be interested in examining carefully one or two chapters. It is intended, however, that each unit will be a useful document for some aspect of CNF planning or management.

Chapter II provides an overview of CNF resources and their uses. It presents an aggregate perspective of current resource allocations in order to discern possible trends toward future allocations. The users of forest resources, the issues surrounding various uses, and the areas of actual or potential conflict are reviewed. Resources are divided into three categories: minerals, renewable natural resources and recreation. Each of these resources is summarized by individual ranger districts, and mineral resources are further summarized by individual mining districts. The chapter also examines a principal method, the public involvement program, which the CNF uses in order to gain some estimate of current demand for the forest's resources. While much of this information may already be familiar to the reader and is largely compiled from existing sources, it was nevertheless felt that it would be of value to the CNF planner and decision-maker to bring the information together and to organize it into a coherent summary form.

Chapter III provides an overview of the socioeconomic-political considerations affecting the CNF resource planning process. Organized around the HRU concept described above, the document contains information pertinent to forest land management, including information on political-institutional arrangements, demographic characteristics and socioeconomic patterns. The HRU concept, the chapter concludes, must be considered a dynamic, fluid concept with "floating boundaries" if it is to help meet the objectives of forest-wide multi-issue planning. Since particular issues at specific points in time will determine the geographic area to be impacted and the array of actors that will be involved, the HRU will need to be modified and reconceptualized for each issue under consideration. The HRU concept has less utility as a vehicle for forest-wide, multi-issue planning than it has for assessing the social impact of a particular activity, such as mining project, on a local area.

Several issue scenarios regarding future supply and demand functions for the CNF are presented in Chapter IV. The issue scenarios examine past trends, current conditions and educated guesses about future events in order to provide a best estimate of what lies ahead. The issue scenarios provided in Chapter IV focus on the three categories of resources described in Chapter II--minerals, renewable forest resources and recreation. Presented in a simplified one page format, each issue scenario is designed to prompt the reader to further expand or clarify projected future impacts based upon his/her understanding of what future supply-demand situations may evolve.

A summary and analysis of the discussions that the UA socioeconomic work group held with the forest supervisor and district rangers of the CNF are presented in Chapter V. The discussions had three objectives: (a) to obtain additional information about the current social and political situation in each district; (b) to obtain the district rangers' assessment of the socioeconomic-political information they would ideally like to receive; and (c) to examine how district rangers in the CNF manage the political aspects of their job by exploring the linkage between the better use of socioeconomic-political information and ranger acquisition of the requisite political skills for gathering and evaluating that information.

The final chapter, Chapter VI, presents the initial outlines of a utilization methodology for integrating socioeconomic-political information into

forest land use planning and decision-making. It suggests that in addition to information about physical and technical resource interactions, decision-makers should also consider three socioeconomic-political elements when making decisions about alternative land use proposals. These three elements, allocative efficiency, distributive equity and political feasibility, are then briefly described.

While all project members participated in overall document preparation, discussing the direction and content of each chapter and reviewing preliminary outlines and drafts, different combinations of project members assumed lead responsibility for the preparation of each chapter. Keith Menzie, Eric Lundgaard, Scott Ullery, Mert Richards, and Dennis Cory worked jointly on Chapter II; Ullery and Hanna Cortner collaborated on Chapters III and V; Ed Carpenter, Richards, and Menzie assumed lead responsibility for Chapter IV; and Cory, Ullery and Cortner cooperated on Chapter VI.

II. SUMMARY OF MAJOR RESOURCES AND RESOURCE DEMAND

INTRODUCTION

The purpose of this overview of Coronado National Forest (CNF) resources and their uses is to provide an aggregate perspective of major resource allocations and general trends toward future allocations. Further, the users of the forest resources, the issues surrounding various uses, and the areas of actual or potential conflict are reviewed.

First, the physical and biological resources of the CNF are summarized by district. In addition, recreational uses of the forest are categorized and discussed as recreational "resources", that is, resources used in particular activities.

Second, the general planning process for the Coronado and, in particular, the public involvement process by which an attempt was made to assess the present demand for forest resources are described. Although demand was not measured in the strict sense of explicit willingness to pay, or make trade-offs, the public involvement program was useful in identifying issues, conflicts, and constituencies of the CNF. Demand, in other words, is defined by source and type rather than by quantity or intensity.

Finally, the basis for conflict and competition among uses is reviewed. The expected, versus the preferred or ideal future, for CNF lands provides an expression of the diversity of values and the potential for dissatisfaction among the forest constituency.

RESOURCES OF THE CNF

The Coronado National Forest is the source for a variety of resources, all of which are important in different ways to different groups of people. Demands are placed on the given resource base which can potentially result in conflict when various uses overlap. In order to deal with these problems effectively, it is important to define the potential resources that are available. These resources have been identified and will be discussed under three classifications based on potential for conflict of demands: 1) "Mineral Resources;" 2) "Renewable Forest Resources;" 3) "Recreation Resources."

Mineral Resources

Several points should be made prior to a description of CNF mineral potential. Minerals are located throughout the land. As technology changes, areas that may have been considered non-mineralized could become productive. Information is difficult to obtain due in part to the secrecy of mineral and mining companies, therefore specific site, quantity and grade information are often not available. Mineral resources are of interest because they provide

the raw material needed for the material goods required by civilization. Minerals are in a practical sense non-renewable.

Commercial minerals can be broken into three types with respect to distribution in Arizona. These are non-metallics, metallics excluding base and precious metals, and base and precious metals.

Non-metallics include as many as fifty mineral compounds. Some examples include sand and gravel, limestone, granite, coal, and ornamental stones such as marble and onyx. On a statewide basis, there are many scattered deposits, but no observable pattern of occurrence emerges. Sand and gravel, a major source of non-metallic revenue for the state, contributed approximately two percent to total gross mineral production value for Arizona in 1976 (VNB, 1977;34). The potential for development of non-metallics in the CNF does not seem to be great. However, some of the worst environmental damage on the CNF has been through exploitation of limestone deposits at Santa Rita and El Tigre Mines. Other limestone deposits are, or will be, developed on the CNF on a small scale, and sand and gravel for highway borrow pits will continue to be provided.

Metallics, excluding base and precious metals, include tungsten, iron, uranium, molybdenum, tin and others. When known occurrences of these metals are plotted on a map of Arizona, a band of concentration appears to run from the west and northwest to the south and southeast. Uranium is a metal within this group which is beginning to show some potential for development, and some parts of the CNF could become involved in commercial uranium production. This will be examined in more detail when specific areas are discussed.

Base and precious metals are highly commercialized in Arizona, with copper producing more than ten times the gross revenue of the next closest revenue earner. In 1976, copper contributed 85 percent of gross revenue from the mining sector of Arizona's economy (VNB, 1977;34). In 1977, Arizona copper production was 61 percent of the total United States copper production". (Keith, 1978;7) Many of the base and precious deposits and potential deposits underlie CNF land. Several areas are under exploration and will be discussed below.

Potential for mineral development will be described in general by CNF ranger district, and then a more specific framework for observation will be described through examining mining districts within each ranger districts.

General Overview of Mineral Potential by CNF District

Santa Catalina Ranger District. The best known potential in this district is in the northern part. Oracle Ridge Mining Partners own claims to land around Marble Peak to the north of Summerhaven. So far, preliminary investigation reveals 11 million tons of 2.25 percent copper ore with an estimated .5 ounces silver per ton byproduct (Greely, 1978). There are signs of mineralization through a large portion of the northern slope of the Catalina Mountains. In addition to copper, there is some tungsten, gold, silver, and silica, a compound used in copper smelting (McAlister, 1978).

Nogales Ranger District. There are four areas of potential located around the Santa Rita Mountains. Historical production records and current exploration indicate possible lead and zinc potential, and several companies have been in and

out of the area with varying degrees of results. The Glove Mine area seems to be of greatest interest. The Fish Canyon and Sawmill Canyon area in the east and Temporal Gulch in the south have some potential for gold and silver, but grades are low, with less than .1 ounce gold and one to two ounces of silver per ton of ore (Van Driel, 1978). The Mount Fagan area has good potential for copper. The Anamax Corporation is working on a land exchange with the Forest Service. This area is believed to hold 320 million tons of .64 percent sulfide copper ore and 20 million tons of .55 percent oxide copper ore (Greely, 1978). There is some work in the Ruby area west of the Atascosa Mountains, but this work is mainly in the form of reprocessing.

Sierra Vista Ranger District. The most promising area for mineral development is throughout the Patagonia Mountains. Currently, the Red Mountain area looks most promising. Kerr-McGee Corporation has published preliminary figures of 100 million tons of .71 percent average grade copper. Earth Sciences, Inc., also has claims to an undisclosed account of Alunite directly above the copper deposit. The Huachuca Mountains have some small pockets of minerals, but there is not much current activity. The Whetstone Mountains have some uranium exploration going on by Kerr-McGee in the northern and eastern portions of the area (Salyer, 1978).

Douglas Ranger District. The Dragoon Mountains have an increasing amount of exploration in the southern two-thirds. There are some limestone claims in the northern end, and gold, silver, lead and zinc are scattered throughout the mountains. Phelps Dodge is doing exploration around Black Diamond Peak in the southern Dragoons, but it can only be speculated that they are looking for copper (Ambrose, 1978). Phelps Dodge and Kennecott are both drilling around Cobra Loma Mine in the south central Dragoon range (Ambrose, 1978). There are some deposits of lead, gold and zinc in the Peloncillos and the western one-fourth of the range is leased to gas and oil exploration. The northern part of the Chiricahua Mountains has some lead, zinc and gold along with a limestone-rock quarry.

Safford Ranger District. Currently, there are no active mining operations in the Safford District. Mineral information is somewhat sparse on this district. The Winchester Mountains are void of mineral activity while the Galiuros have some copper in the northern part of the range. In the northern Santa Teresas, Exxon is exploring for copper. Copper is suspected to exist in the northern Galiuros around Rattlesnake Canyon and Copper Creek (Rhea, 1978). There may also be some geothermal potential around Stockton Pass in the Pinateno Mountains.

General Overview of Mineral Potential by Mining Districts

In order to describe mineral locations more accurately, it will be useful to relate occurrence to specific mining districts. These districts are illustrated in Figure II-1. For years, areas of relatively active mining claims have been grouped together into mining districts, many of which lie on CNF land. Because mining district boundaries have remained relatively stable over the years, districts provide a useful breakdown for analysis of mineral potential through historical production records. These records are summarized in Table II-1. Unfortunately, this type of breakdown is not available for the subdivisions of the Safford District.

1. ORACLE
2. HELVETIA - ROSEMONT
3. TYNDALL
4. WRIGHTSON
5. GREATERVILLE
6. ORO BLANCO
7. HARSHAW
8. PALMETTO
9. PATAGONIA
10. HARTFORD (HUACHUCA)
11. WHETSTONE
12. MIDDLE PASS
13. CALIFORNIA
14. DRAGOON

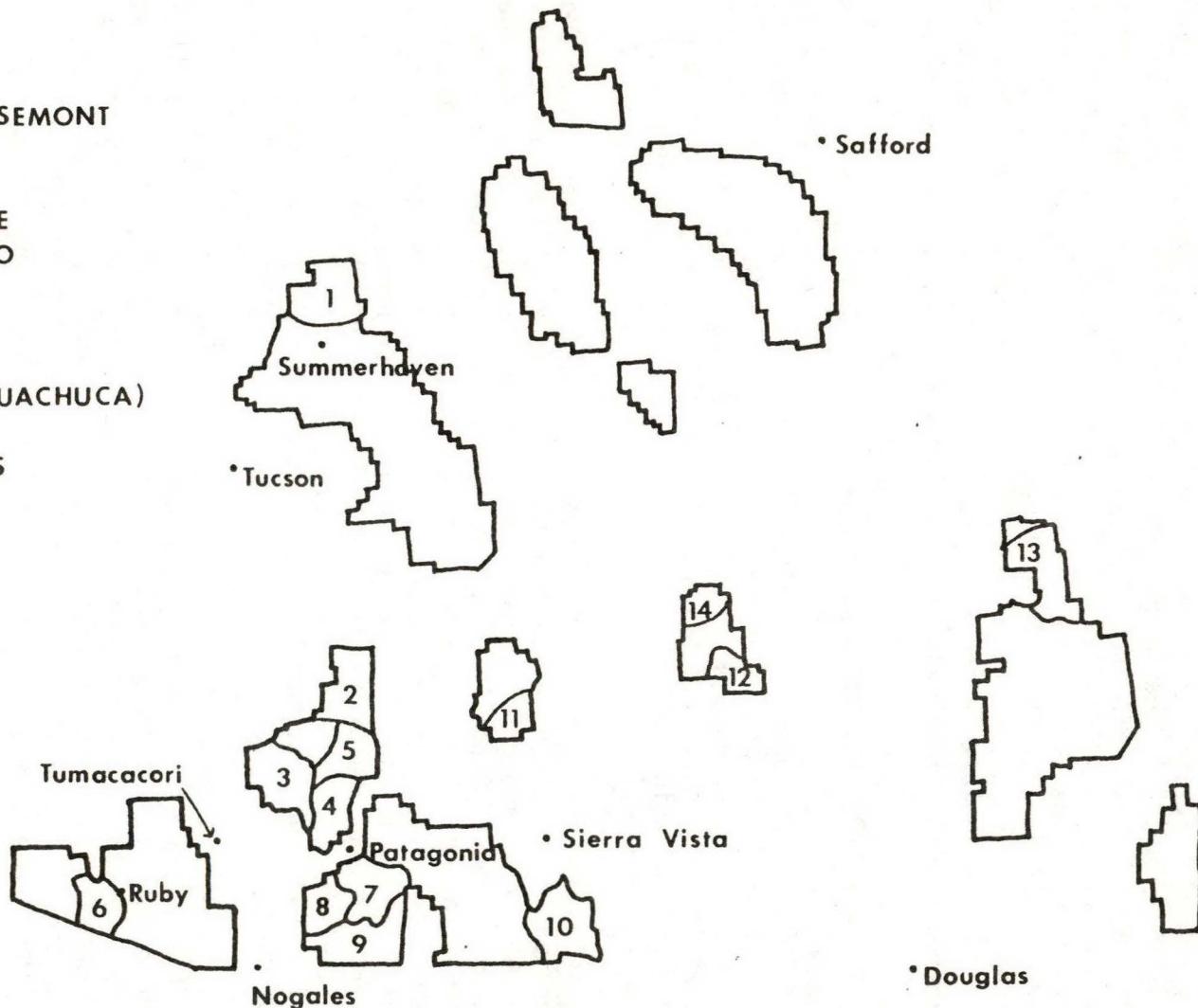


Figure II-1: Mining Districts within the Coronado National Forest.

Table II-1: Historical Production of Various Mining Districts Through 1970

| <u>District</u> | <u>Short tons ore (1000's)</u> | <u>Lbs. Copper (1000's)</u> | <u>Lbs. Lead (1000's)</u> | <u>Lbs. Zinc (1000's)</u> | <u>Oz. Gold</u> | <u>Oz. Silver (1000's)</u> | <u>Value in 1000's of \$</u> |
|------------------------|------------------------------------|---------------------------------|-------------------------------|-------------------------------|---------------------|--------------------------------|----------------------------------|
| Oracle | 136 | 6,117 | 188 | 50 | 387 | 1,181 | 861 |
| Helvetia-Rosemont | 426 | 34,860 | 521 | 1,360 | 1,581 | 3,469 | 7,776 |
| Tyndall | 56 | 1,036 | 18,782 | 5,513 | 1,281 | 4,766 | 3,645 |
| Wrightson | 4 | 237 | 951 | - | 386 | 508 | 138 |
| Greaterville | 2 | 39 | 343 | 32 | 28,838 | 1,866 | 650 |
| Oro Blanco | 909 | 5,113 | 60,987 | 52,723 | 126,450 | 46,218 | 12,944 |
| Harshaw | 1,312 | 6,286 | 143,609 | 172,720 | 4,347 | 91,993 | 41,536 |
| Palmetto | 132 | 11,004 | 499 | 2 | 242 | 750 | 2,103 |
| Patagonia | 691 | 36,665 | 43,025 | 53,771 | 7,267 | 32,635 | 17,862 |
| Hartford (Huachuca) | 9 | 74 | 588 | 375 | 393 | 25 | 140 |
| Whetstone | 2 | 37 | - | - | 8 | 620 | 15 |
| Middle Pass | 76 | 2,011 | 274 | 9,251 | 337 | 147 | 1,725 |
| California | 38 | 299 | 8,631 | 1,179 | 100 | 152 | 1,750 |
| Dragoon | 19 | 18 | 356 | 249 | 9,741 | 72 | 340 |

II-5

Source: Stanton, Keith, 1973. Index of Mining properties in Cochise County, Arizona, Bulletin 187. University of Arizona, Tucson; Stanton Keith, 1974. Index of Mining Properties in Pima County, Arizona, Bulletin 189. University of Arizona, Tucson; and Stanton Keith, 1975. Index of Mining Properties in Santa Cruz County, Arizona, Bulletin 191. University of Arizona, Tucson.

Santa Catalina Ranger District.

a) Oracle Mining District.

This district is located on the north slope of the Catalina Mountains. The southern half is in Pima County and the northern half is in Pinal County. "The Marble Peak area of this district appears to be well mineralized. Present development work should indicate the extent of the copper deposit. From the information being revealed in that work, possibilities are good that other deposits may be found in the area. Mineralization of Marble Peak has been known for fifty years, but rough terrain and difficult access have discouraged activity" (Keith, 1974:35).

Nogales Ranger District.

a) Helvetia-Rosemont Mining District.

This district is located in the northern part of the Santa Rita Mountains within Pima County. The ore bodies that have been mined have been generally small. Copper is the dominant metal, but some lead, zinc, tungsten and molybdenum may be locally important (Keith, 1974: 30). The district is well mineralized. Copper has been found and additional metals are likely to occur. Terrain is moderately rugged, but generally accessible.

b) Tyndall Mining District.

This district is located in the western part of the Santa Rita Mountains in Santa Cruz County. "Strong northwestward alignment of faults from Red Mountain appears to be the center for intense copper mineralization and suggests a need for more extensive geologic exploration which may result in deep economic benefits" (Keith, 1975:27). There has been little recent production from this district other than from the Glove Mine.

c) Wrightson Mining District.

This is located to the south of Mount Wrightson in the Santa Rita Mountains within Santa Cruz County. "Economic mineralization of the district has been sparse; however, little geologic study has been made in the southern area for possible deep economic mineralization extending northward from Red Mountain" (Keith, 1975:29).

d) Greaterville Mining District.

This district is located in the eastern part of the Santa Rita Mountains in Pima and Santa Cruz Counties. "No large economic mineral deposits have been discovered. Chances for large deposits are unfavorable" (Keith, 1975:10).

e) Oro Blanco Mining District.

This district is located near Ruby west of the Atascosa Mountains in Santa Cruz County. "Most of the mineralization in the Oro Blanco District has been found to be superficial."

Sierra Vista Ranger District.

a) Harshaw Mining District.

This district is located in the Red Mountain area southeast of Patagonia in Santa Cruz County. "The topography of the district is rough and irregular, but the district is well mineralized. Many favorable geologic conditions indicate more undiscovered metal deposits in addition to the fairly well-known deposits at Red Mountain" (Keith, 1975; 13-14).

b) Palmetto Mining District.

This district is located southeast of Red Mountain in the western Patagonia Mountains in Santa Cruz County. "The geology is not favorable for economic mineral deposits, but some formations may yield copper in depth along the eastern part of the district" (Keith, 1975; 20).

c) Patagonia Mining District.

This district is located south of Red Mountain in the central portion of the Patagonia Mountains in Santa Cruz County. The eastern section of the district presents favorable possibilities for hidden orebodies.

d) Hartford (Huachuca) Mining District.

This district is located in the eastern Huachuca Mountains south of Sierra Vista in Cochise County. No detailed geologic studies of this district have been made.

e) Whetstone District.

This district encompasses the Whetstone Mountains to the north of Sierra Vista in Cochise County. Copper, Tungsten and uranium have been mined on small scale in this district. Low grade uranium proved economic during years of premium pricing (Keith, 1973;15). Uranium exploration is going on in the eastern and northern parts of the district.

Douglas Ranger District.

a) Middle Pass Mining District.

This district is located in the southeast Dragoons around Black Diamond Peak in Cochise County. Although there has been little production

in recent years, considerable exploration is going on and the district should begin to yield minerals.

b) California Mining District.

This district is located in the northern portion of the Chiricahua Mountains especially to the east of the Chiricahua National Monument. It is located in Cochise County. "The district has been almost dormant for the past 15 years, but mineralization in the Peloncillo Mountains of New Mexico may indicate some adjacent mineralization in the district" (Keith, 1973;7).

c) Dragoon Mining District.

This district is located in the northern and eastern portion of the Dragoon Mountains in Cochise County. Some lead and zinc have been mined as well as some marble. There is no active mining at the present time.

Safford Ranger District.

No specific mining district information was available in published form.

A summary of the preceding information can be seen in Table II-2. In addition, maps of the ranger districts showing general mineral locations are included in Figures II-2 through II-6.

In addition to information on minerals within the Coronado National Forest, it is important to look at areas not within the forest but within the impact region of the forest. Clearly, new mineral development off forest land will bring increased population that will impact the recreation resources of the CNF. An exhaustive review of all potential sites for mineral development has not been made, but this aspect of mineral potential will play an important role in future planning decisions for the CNF. Currently there are no such areas close to production; however, a belt five to ten miles wide running parallel to the Santa Cruz River from the Mexican Border north to Tucson has good potential for future mineral development, especially copper.

Renewable Forest Resources

Renewable forest resources are defined as those resources having regenerative capabilities that can be sustained using watershed management practices in conjunction with the physical and biological systems of the forest. Four categories will be discussed as follows: timber, forage, water, and wildlife. In addition to having extractive value, these four resources comprise a base for recreational activity. This recreation resource can be altered by utilizing the renewable or mineral resource components. Due to the interrelationship and its implications for demand conflicts, recreation will be treated under a separate classification scheme.

Table II-2: Summary Table

| <u>Ranger District</u> | <u>Mining Operation</u> | <u>Location</u> | <u>Type of Mineral</u> | <u>Mining Company</u> |
|------------------------|---|--|------------------------|------------------------------|
| Catalina | Marble Peak | N. of Summerhaven | Cu, Ag, Au | Oracle Ridge Mining Partners |
| Nogales | Mount Fagan Glove Mine | N. Santa Ritas S.W. Santa Ritas | Cu Pb, Zn | Anamax Corp. |
| Sierra Vista | Red Mountain Whetstone | Patagonia Area N & E - Whetstone | Cu Ur | Kerr-McGee Kerr-McGee |
| Douglas | Black Diamond Pt. & Cobra Loma Mine Peloncillos Mt. | S. Dragoon Mt. Western 1/4 | Cu Gas & Oil | Phelps-Dodge & Kennecott |
| Safford | Stockton Pass Santa Teresa Galiura | S. Pinaleno Mt. N. Santa Teresa Mt. Copper Cr. & Rattlesnake | Geothermal Cu Cu | Exxon |

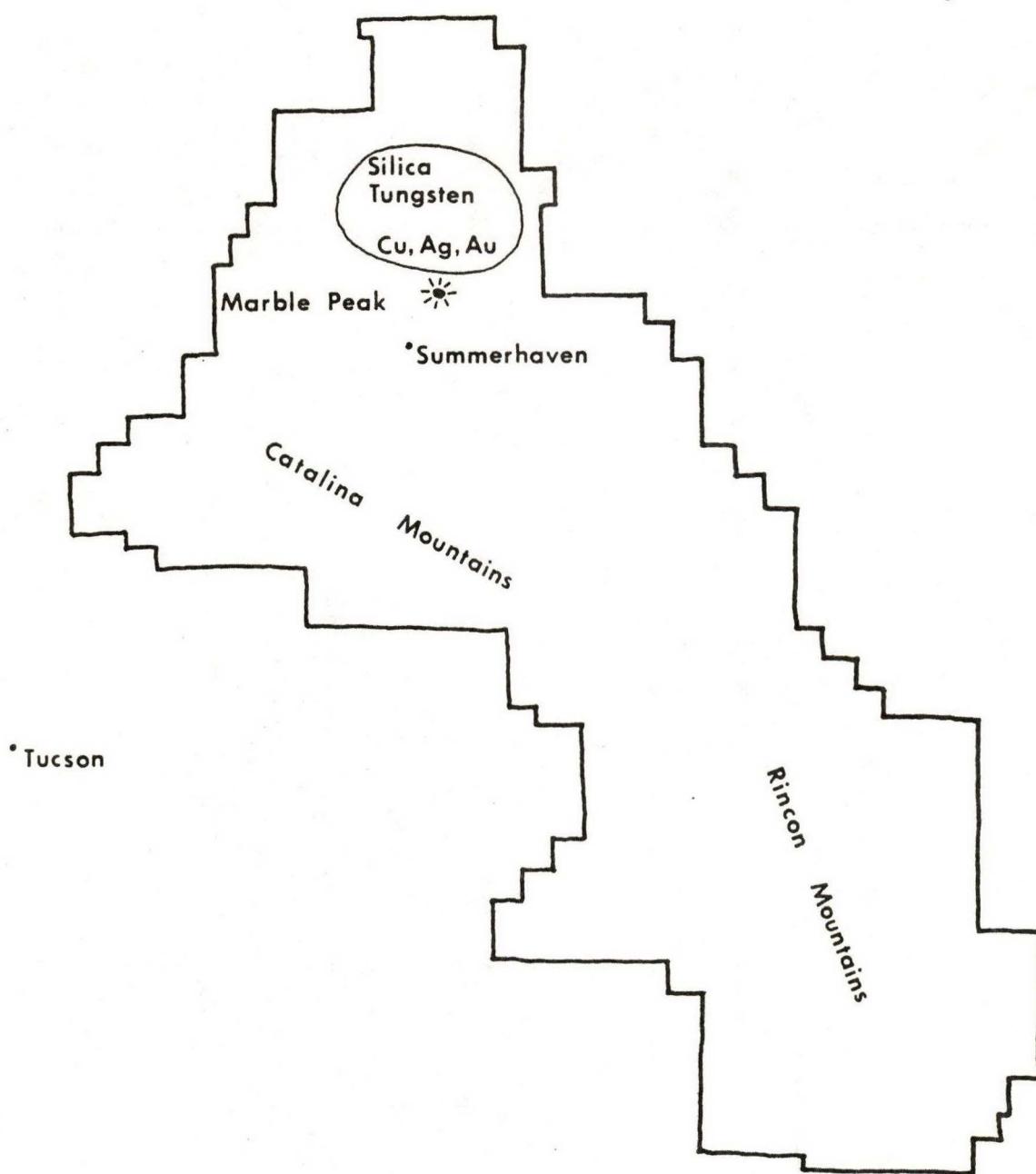


Figure II-2: General Mineral Locations in the Catalina Ranger District.

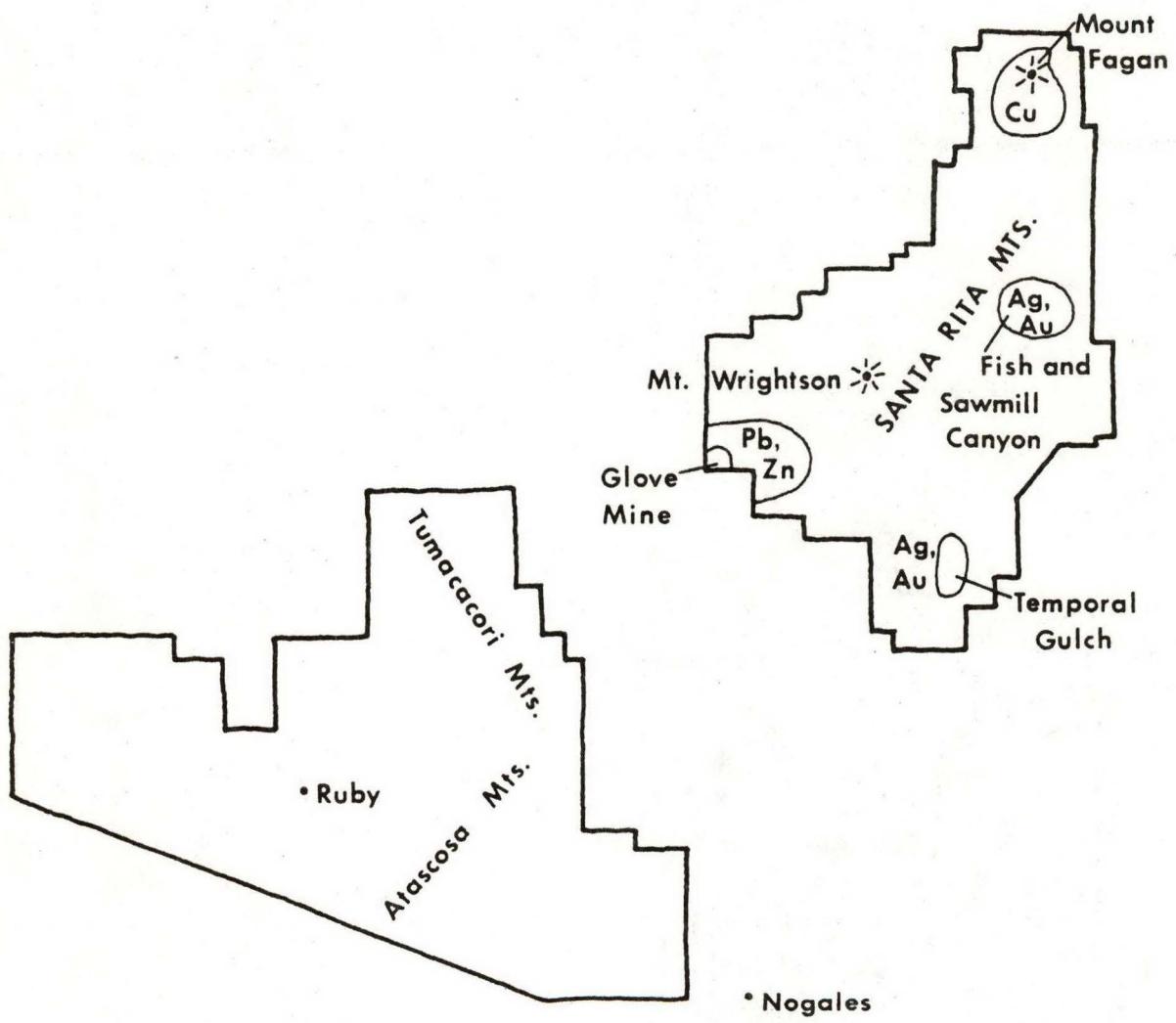


Figure II-3: General Mineral Locations in the Nogales Ranger District.

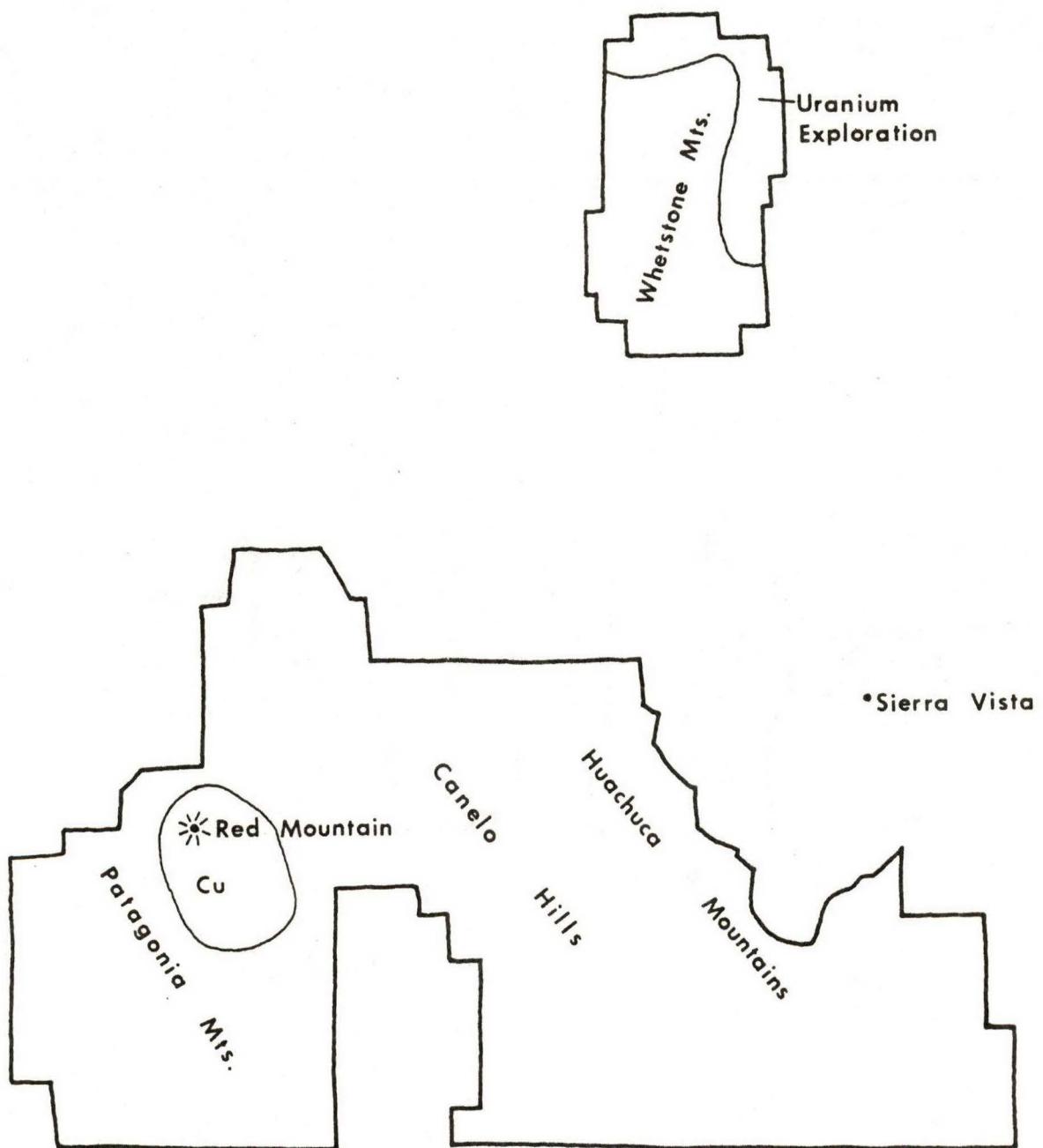


Figure II-4: General Mineral Locations in the Sierra Vista Ranger District.

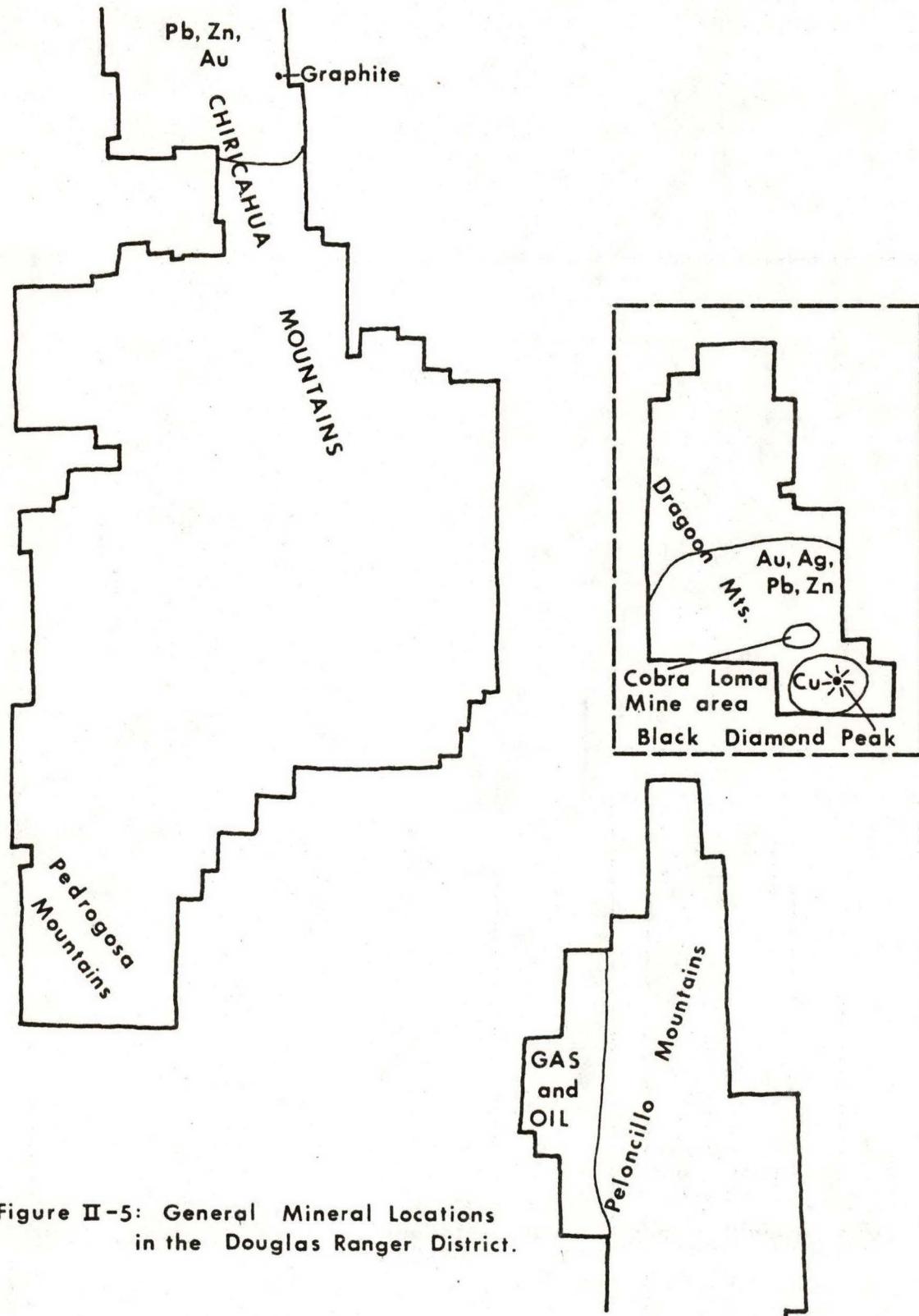


Figure II-5: General Mineral Locations
in the Douglas Ranger District.

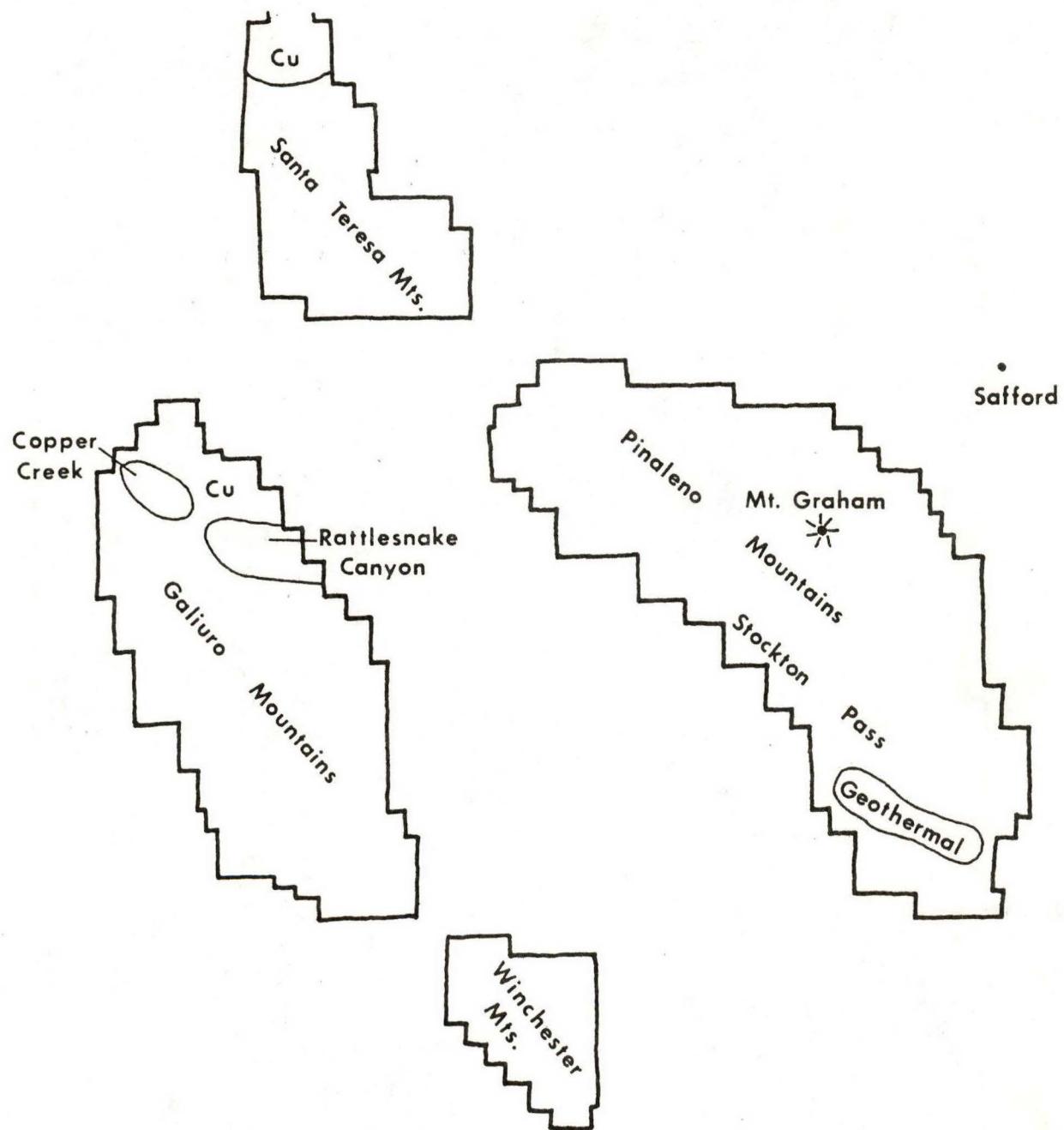


Figure II-6: General Mineral Locations in the Safford Ranger District.

Historically, grazing and timber cutting provided the dominant renewable resource use (Winn, 1945). Sawmills were built locally to serve the mines' demand for timber products. Grazing permits were issued, and an allotment system begun in 1906 to establish control of the forage resource. These once dominant uses of the CNF have declined over the years while the importance of water and wildlife has increased. The changing priorities are largely a result of increasing urbanization and increasing recreational use of the forest.

The Forest Service currently de-emphasizes the harvest of commercial timber on the CNF due to minimal quantities and alternative management objectives. The forest supplies an average of four million board feet of timber annually. Three and one-half million board feet are cut for fuel-wood while the remaining 500,000 board feet is harvested for sawlogs and posts (Table II-3).

The average stocking of Arizona's commercial timber lands is 7200 board feet per acre (Setzer and Throssell, 1974). Stocking on the Coronado varies from 5,000 to 2,500 board feet per acre, which is 2200 to 4700 board feet below the state average (Table II-4). The roundwood harvest for Arizona was 364,182,000 board feet in 1974, showing a slight decline from previous years' harvest or 6,365,000 board feet. Roundwood harvest of five million board feet should be sustainable under present forest management (Setzer and Throssel, 1974).

Fuelwood, the major component of the roundwood harvest, is cut by individuals or commercial firms for \$2.50 or \$5.00 per cord respectively. Individual cutters average 1,000 to 1,500 board feet (2-2.5 cords), while commercial harvests are substantially greater (Shupe, 1978).

The rangeland of the Coronado National Forest provides forage for domestic and wild animals. Permittees obtain 324,000 animal unit months (AUM) from range allotments (Table II-5). Additional forage is taken by approximately 3800 mule deer, 10,950 white tail deer, 90 antelope, and 60 bighorn sheep (Table II-6). The number of allotments has declined over the years. Permanent grazing permits have been reduced to temporary status and subsequently phased out. The result is a loss of AUM's from previous levels.

Water runoff has a number of potential uses that can be characterized as increasing over time. Broad categories of uses include power generation, mining, irrigation, fish and wildlife, industrial and urban. The surface runoff for the State of Arizona is 4.2 million acre feet (Kelso, et.al., 1973). Surface runoff from the Coronado provides only 2 percent or 95,400 acre feet, of this resource (Table II-6). The runoff not impounded or lost through evaporation and transpiration on the forest is left to recharge the groundwater in the vicinity of the mountain front. The potential for augmenting the supply of this runoff through vegetative manipulation appears to be limited for the CNF (Ffolliott and Thorud 1975).

Future implications for changing water appropriations include those stemming from federal reserve water rights and changes in demand from off-forest users. Federal reserved water rights are the result of a judicial doctrine

Table II-3: Timber Harvest Schedule

| <u>District</u> | <u>Bd. Ft.</u> <u>(Millions)</u> | <u>Fuelwood</u> | <u>Commercial</u> <u>Timber</u> |
|-----------------|-------------------------------------|-----------------|------------------------------------|
| Nogales | 1 | 1 | --- |
| Douglas | 1 | 1 | --- |
| Sierra Vista | 1 | 1 | --- |
| Santa Catalina | .50 | .25 | .25 |
| Safford | <u>.50</u> | <u>.25</u> | <u>.25</u> |
| Total | 4.0 | 3.5 | .50 |

Total cut between 1963-1974 - 30 million bd. ft. Any increased cuts come from Pinaleno Mountains in the Safford District.

International 1/4 inch log rule

Source: "Cut and Sold" Annual Report 2400-49, 1978

Table II-4: Timber Inventory

| <u>Range</u> | <u>Acres</u> | <u>Bd. Ft./Acre*</u> | <u>Total (Millions)</u> |
|----------------|--------------|----------------------|-----------------------------|
| 1) Catalinas | 5,000 | 5,000 | 25 |
| 2) Grahams | 10,000 | 2,500 | 25 |
| 3) Chiricahuas | <u>8,000</u> | <u>2,500</u> | <u>20</u> |
| Totals | 23,000 | 10,000 | 70 |

* Board feet in international 1/4 inch log rule.

Source: Howard Shupe, Management Staff Officer, Coronado National Forest, 1978. Personal Communication.

Table II-5: Grazing Allotments

| <u>District</u> | <u>Acres</u> | <u>AUM's</u> | <u>Average Industry (AUM's/Acre)</u> |
|-----------------|----------------|---------------|--|
| Nogales | 349,552 | 88,760 | .2539 |
| Douglas | 362,925 | 78,275 | .2157 |
| Sierra Vista | 325,165 | 88,386 | .2718 |
| Santa Catalina | 216,600 | 28,110 | .1344 |
| Safford | <u>387,791</u> | <u>40,756</u> | <u>.1050</u> |
| Total | 1,642,033 | 324,287 | .9800 |

Source: Grazing Allotments, Grazing Permit Information
CP 2230-1, CP02221.i-01, 1978.

Table II-6: Wildlife Report*

| District | Antelope | Black Bear | Bighorn Sheep | Mountain Lion | Mule Deer | Javelina | Turkey | Whitetail Deer | Big Game Species | Small Game Species | Endangered/Unique Species |
|----------------|-------------|-------------|---------------|---------------|------------------|---------------|-------------|------------------|------------------|--------------------|---------------------------|
| Santa Catalina | 0 | 10-0 | 60-2 | 25-4 | 1,000-180 | 2,800-350 | 250-4 | 1,700-110 | 7 | 27 | 1/31 |
| Nogales | 10-0 | 0 | 0 | 52-2 | 600-40 | 2,100-450 | 40-0 | 3,750-600 | 7 | 35 | 3/41 |
| Sierra Vista | 45-0 | 15-0 | 0 | 20-0 | 600-29 | 3,100-165 | 25-0 | 3,200-275 | 7 | 35 | 3/46 |
| Douglas | 0 | 5-2 | 0 | 10-8 | 200-40 | 200-10 | 10-0 | 800-50 | 5 | 29 | 3/35 |
| Safford | <u>35-0</u> | <u>85-6</u> | <u>0</u> | <u>75-7</u> | <u>1,400-200</u> | <u>650-80</u> | <u>20-0</u> | <u>1,500-100</u> | <u>7</u> | <u>20</u> | <u>3/37</u> |
| Totals | 90-0 | 133-8 | 60-2 | 182-21 | 3,800-489 | 8,850-1,055 | 345-4 | 10,950-1,135 | 33 | 146 | 13/190 |

*Numbers represent: population totals - numbers taken through hunting, except for the last three columns, which indicate number of species in each category.

Source: "Wildlife Report" FSM 2664, 1978.

It is doubtful that
there are 33 big
game species, etc.

II-19

declaring that when the federal government reserves lands on national forests, it also reserves the water necessary to make use of the land (U.S. v. New Mexico, 57 L. Ed. 1052, 1978). Recent Supreme Court decisions have begun to quantify federal reserve water rights and have resulted in a less extensive definition than some federal and management had hoped for. The change in the rural-urban population mix may further complicate the water rights question, adding new pressures to intensify management of the water resources of the forest in an attempt to maximize benefits.

Wildlife resources on the CNF constitute a category of major importance to recreational and scientific users. In addition to the occurrence of most of the well known large mammals, numerous ~~exotic~~ and unique species exist in the area. Several birds and reptiles, and a few mammals, found on the CNF occur nowhere else in the United States. Examples are the coppery-tailed trogon, the twin-spotted and ridgenosed rattlesnakes, and the coati mundi. Unverified sightings suggest that the Mexican wolf and Sonoran pronghorn are infrequent visitors to the southernmost districts of the CNF.

General Overview of Renewable Resources by CNF District

Santa Catalina Ranger District. The highest level of stocking of commercial timber is found in the Catalina Mountains. Five thousand acres of timber are located at the eight thousand foot elevation and higher, stocked at five thousand board feet per acre. The only operational sawmill in the CNF, located in the Catalina Mountains, processes an average of 250,000 board feet per year for the district, making the total roundwood harvest 500,000 board feet annually.

The forage resource of the district provides 28,000 AUM's annually. Allotment numbers total seventeen, showing a decline from previous numbers.

The number of acres grazed is 80 percent of the total acreage of the district; 216,600 from a total of 264,200 acres (Table II-5). The average for the forest is 90 percent. All areas that are closed to grazing are open to, and receive heavy use from certain forms of recreation (Figure II-7).

Two lakes, Rose Canyon and Sycamore, are supplied by surface runoff from the Catalina Mountains. Numerous streams, including the perennial Sabino Creek, receive flow from runoff events on the district. The runoff for the district is 15,600 acre feet (Table II-7).

Big game ONLY

Wildlife populations include sixty bighorn sheep, 1000 mule deer, and 1700 white tail deer. Seven big game and twenty-seven small game species also reside on the district (Table II-8). The bighorn sheep population is the only one on the CNF.

In summary, the Catalina Ranger District provides half of the CNF's commercial timber from its five thousand acres. The Pusch Ridge Wilderness area of the Catalina Mountains provides habitat for the only population of bighorn sheep on the CNF. Grazing use, in terms of total district acreage, is below the average for the CNF.

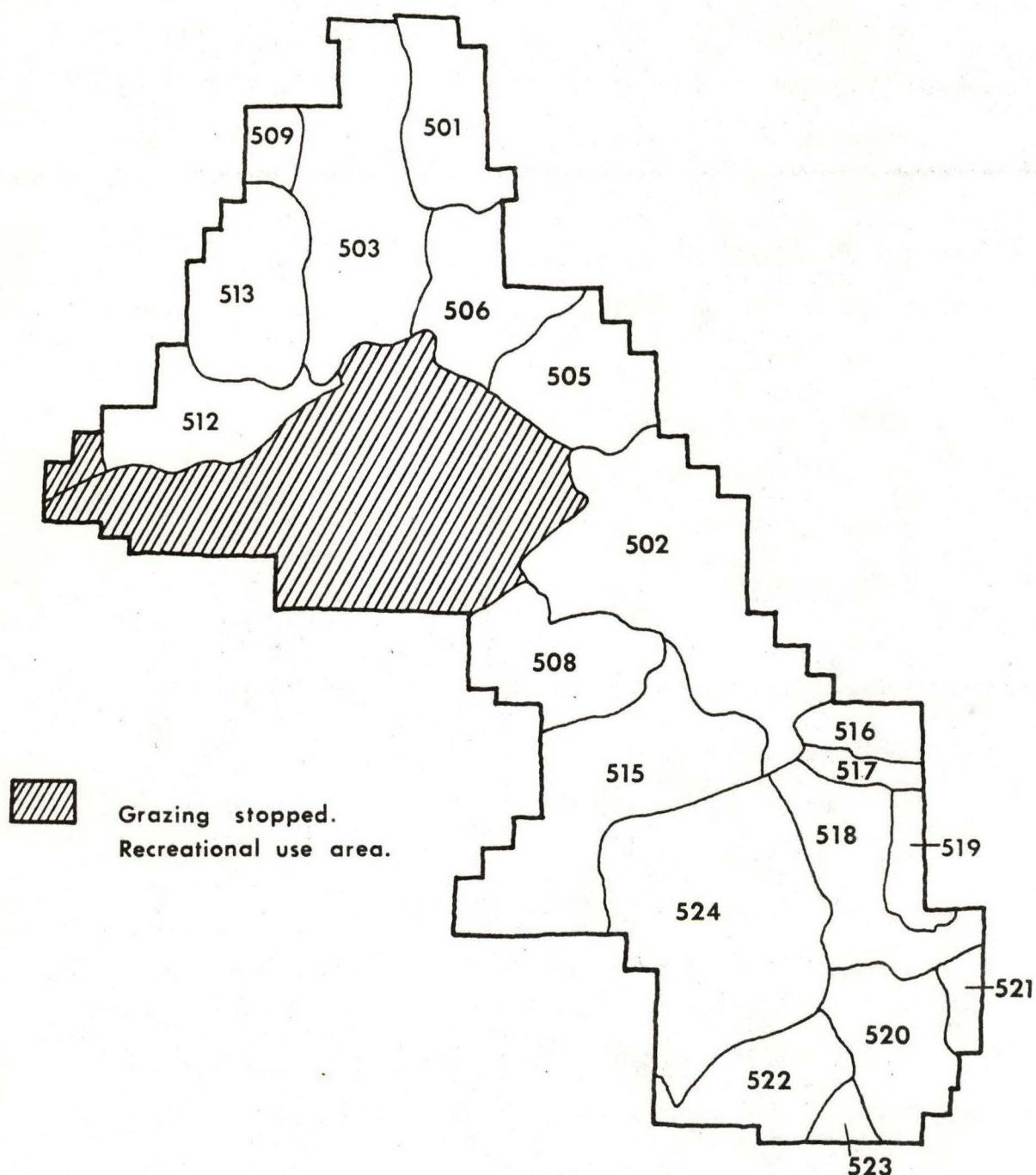


Figure II-7: Grazing Allotments in the Catalina Ranger District.
(Numbers coincide with allotment numbers.)

Table II-7: Surface Runoff Data for the Coronado by District

| | <u>Average Annual Yield in Acre Feet</u> |
|---------------------------------|--|
| <u>Douglas District:</u> | |
| Chiricahuas | 18,400 |
| Dragoons | 2,300 |
| Peloncillos | 3,500 |
| <u>Nogales District:</u> | |
| Atascosa and Tumacacoris | 7,700 |
| Santa Ritas | 5,400 |
| <u>Sierra Vista District:</u> | |
| Canelo and Huachucas | 10,900 |
| Whetstones | 1,900 |
| <u>Safford District:</u> | |
| Grahams | 16,800 |
| Winchesters | 1,100 |
| Santa Teresas | 2,100 |
| Galiuros | 9,700 |
| <u>Santa Catalina District:</u> | |
| Santa Catalinas | 13,500 |
| Rincons | 2,100 |
| | <u>95,400</u> |

1 acre foot = 1 acre of water 1 foot deep

Source: Paul Gregory, Hydrologist, Coronado National Forest.
1978. Personal communication.

Nogales District. One-fourth of the roundwood harvest on the CNF is cut for fuelwood from the Nogales Ranger District. Approximately fifty permits are sold annually to Mexican citizens (Shupe, 1978). No commercial timber is located on this district.

The relatively high rainfall on this portion of the CNF provides a good forage resource for domestic herds of livestock. Total acreage grazed includes 95 percent of the district's total acreage of 369,600 acres. The only significant closure to grazing is Madera Canyon (Figure II-8).

Surface runoff for the district is 13,100 acre feet. Portions of this runoff feed the fifty-acre Pena Blanca Lake. The runoff also helps support large wildlife populations of whitetail and mule deer, numbering 3,750 and 600 respectively. Seven big game and thirty-five small game animal species occur on the district, including ten antelope.

In summary, the Nogales Ranger District produces one fourth of the roundwood timber for the CNF in the form of fuelwood. Its grazing resource provides 88,760 AUM's, and acreage utilization is above average for the forest.

Sierra Vista Ranger District. Like the Nogales Ranger District the only timber resource on the Sierra Vista Ranger District is fuelwood, which provides one-fourth of the CNF's annual roundwood harvest. Mexican citizens obtain approximately 100 cutting permits annually in the Sierra Vista and Douglas Ranger Districts (Shupe, 1978).

The high rainfall in the Sierra Vista Ranger District also helps support 88,400 AUM's on 325,160 acres. Ninety percent of the 333,800 acres is grazed. A portion of the removed acreage is used as an experimental ranch near Elgin, Arizona (Figure II-9).

Parker Canyon Lake is served by a portion of the 12,000 acre feet of water runoff for the district. Additional water use is obtained for wildlife, which include seven big game species and thirty-five small game species. Whitetail deer, mule deer, and antelope number 3,200, 600, and 45 respectively.

In summary, the highest grazing intensity on the CNF can be found on the Sierra Vista Ranger District. The harvest of fuelwood compares equally with the Nogales and Douglas Ranger Districts.

Douglas Ranger District. Like the previous districts, the Douglas Ranger District provides one-fourth of the roundwood harvest for the CNF. In addition, 8,000 acres of commercial timber are located on the western edge of the Chiricahua wilderness. The timber is stocked at 2,500 board feet per acre.

The number of acres used for domestic grazing compared to the total acreage is below average for the CNF. Domestic grazing use obtains 78,000 AUM's on 36,300 acres with 81,500 acres not being used for grazing over the entire district. Therefore, only 83 percent of the land is being used for grazing. (Figure II-10).

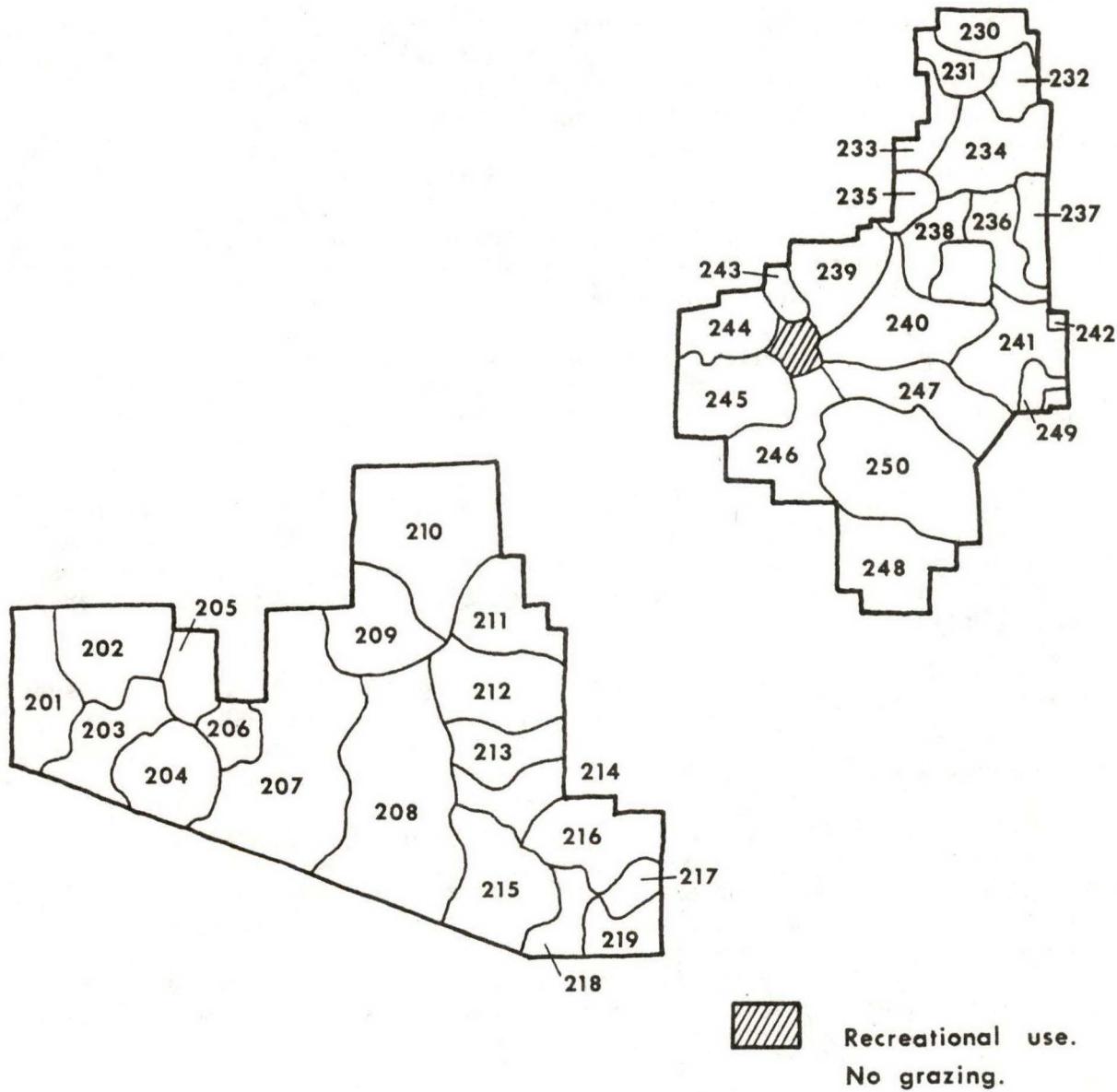


Figure II-8: Grazing Allotments in the Nogales Ranger District.
(Numbers coincide with allotment numbers.)

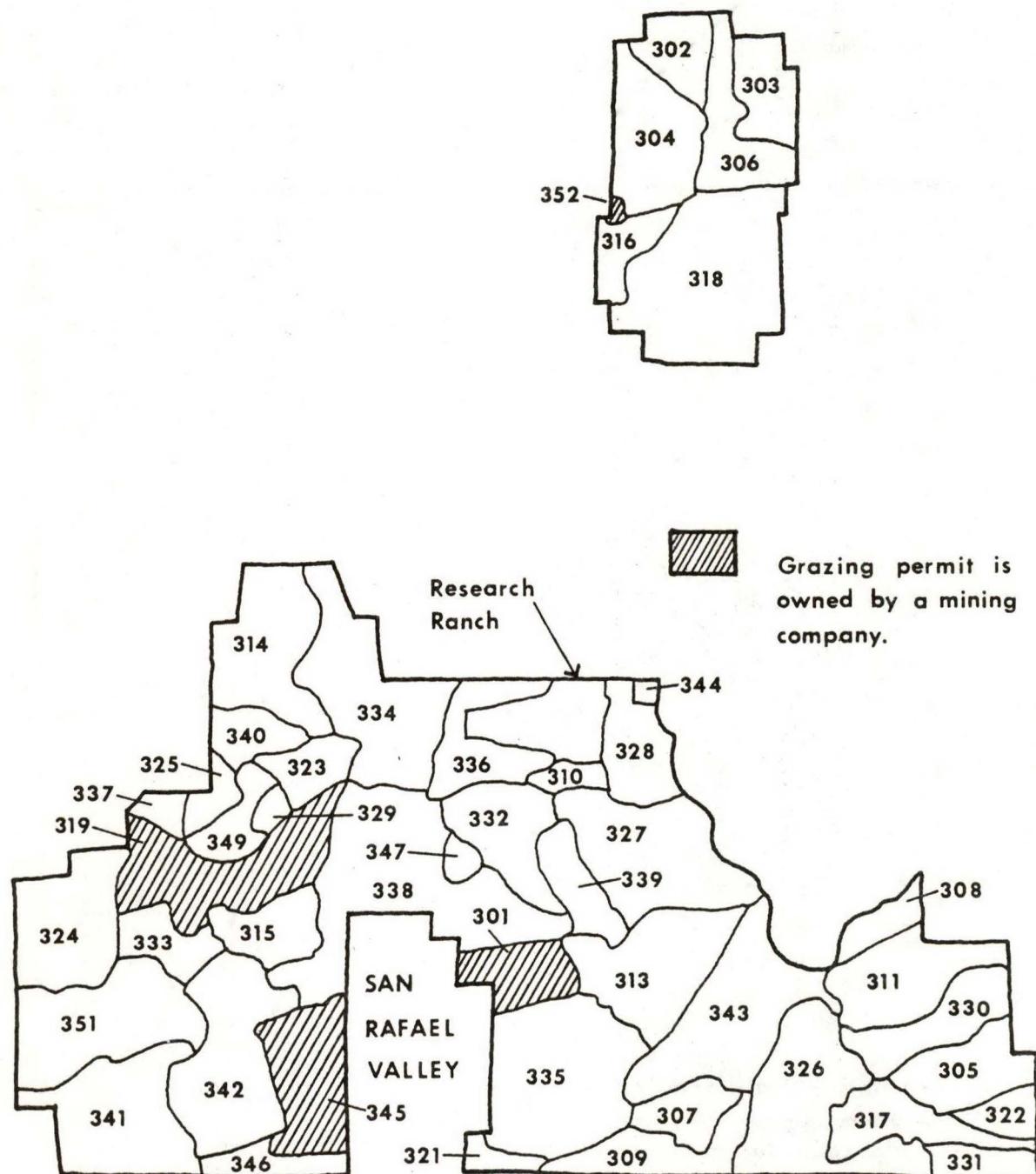
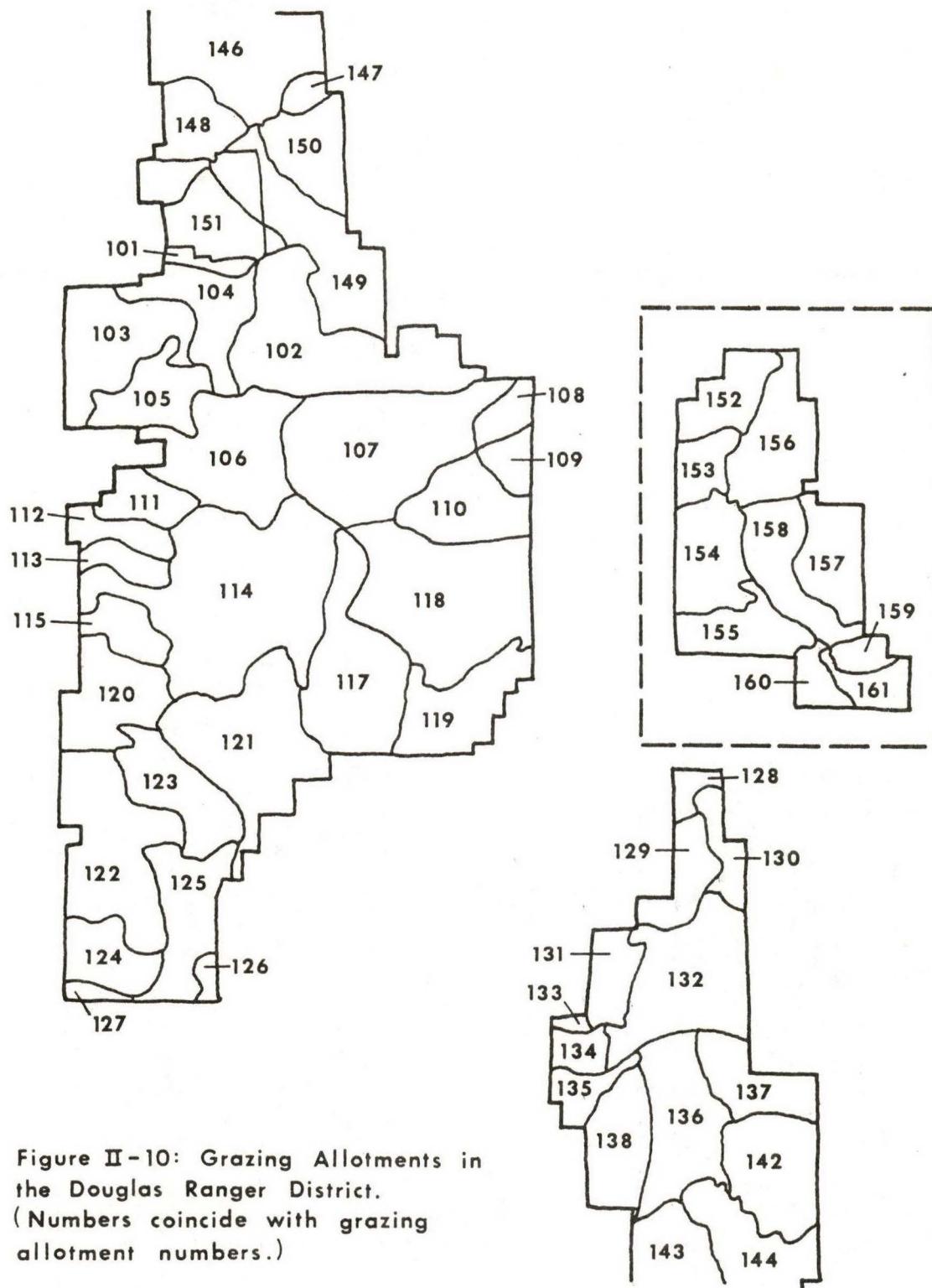


Figure II-9: Grazing Allotments in the Sierra Vista Ranger District.
(Numbers coincide with grazing allotment numbers.)



**Figure II-10: Grazing Allotments in the Douglas Ranger District.
(Numbers coincide with grazing allotment numbers.)**

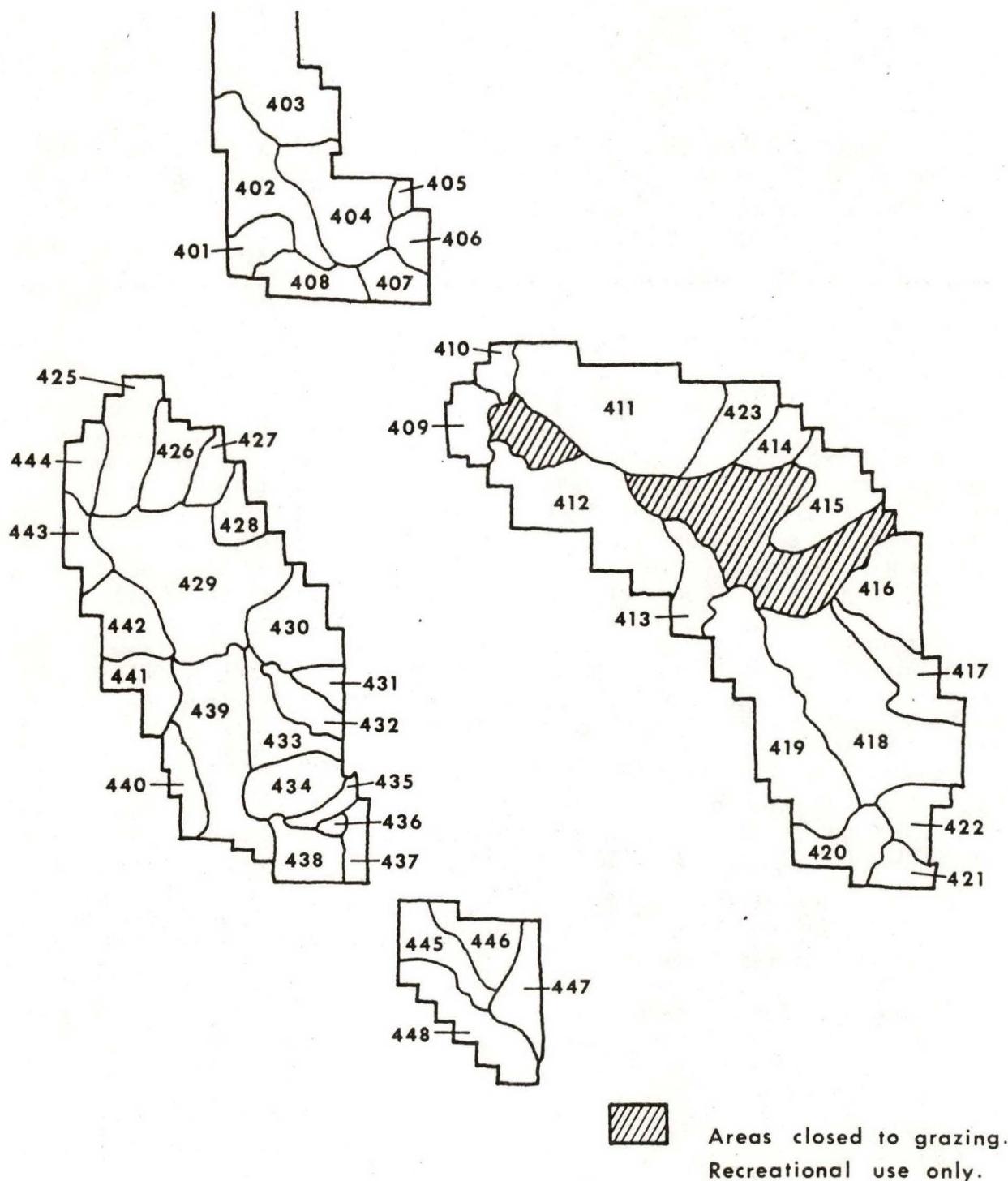


Figure II-11: Grazing Allotments in the Safford Ranger District.
(Numbers coincides with grazing allotment numbers.)

The surface water runoff provides Rucker Lake with water in addition to maintaining perennial flow in Turkey Creek on the Chiricahua Mountains. Runoff totals 24,200 acre feet for the three mountain ranges in the district, which is the greatest runoff for all CNF districts.

The Douglas Ranger District has five big game species and twenty-nine small game species. Whitetail deer and mule deer number 800 and 200 respectively, which is lower than other districts.

In summary, 8,000 acres of commercial grade timber exist in the Chiricahuas. The district has the highest runoff, 24,200 acre feet, of all CNF districts. Rucker Lake and Turkey Creek provide water-based recreation from this surface runoff.

Safford District. The Pinaleno Mountains are the highest of the mountain ranges in the CNF. They provide a large number of acres of commercial timber due to the interaction of elevation and rainfall. Ten thousand acres of commercial forest can be found in the upper elevations of these mountains. The low stocking rate of 25,000 board feet per acre in addition to transportation costs to the closest mill, located near Globe, Arizona, can be cited as the reasons for a small annual harvest. Harvest cuts of 25,000 board feet of fuelwood are made annually in addition to one-half the commercial timber harvest of the CNF.

The lowest average grazing intensity for the CNF is found on the Safford Ranger District. The grazing allotments provide 40,700 AUM's on 388,800 acres out of the total acreage of 390,100. The number of allotments is declining in the Pinaleno Mountains (Figure II-11).

Several perennial streams and Riggs Lake are fed by 16,800 acre feet of runoff from the Pinaleno Mountains, making a total of 29,700 acre feet of runoff for the entire district. Two of the perennial streams are Ash Creek and Frye Creek both of which provide trout fishing in their upper reaches.

Wildlife populations include seven big game species and twenty small game species. Whitetail deer and mule deer number 1,500 and 1,400 respectively. The district also has thirty-five antelope.

In summary, ten thousand acres of commercial timber land are stocked at 2,500 board feet per acre in the Pinalenos. The only perennial streams with trout on the CNF can be found in the Pinaleno Mountains in addition to the recreation resource of Riggs Lake.

Recreation Resources

Recreational experiences derived from the forest are numerous and diverse. Some recreation experiences depend on extraction of a resource such as hunting and fishing, while other recreational experiences are derived from an amenity service with very little physical impact on other forest resources.

Recreational experiences are not always compatible, as with wilderness use and off road vehicle (ORV) recreation. However, many uses can frequently be sustained from the same area with little or no conflict. In general, congestion and/or conflicting recreational experiences cause the greatest problems.

The recreational use of the CNF is increasing due to a growing population. As recreational demand grows, the traditional use of the Coronado's renewable resources is changing. Some grazing permits on the Pinaleño and Catalina Mountain ranges have been changed to temporary status and subsequently terminated in an effort to mitigate resource damage. At the same time, recreational use of these lands has increased. The management objectives for the timber resource also reflect the importance of recreation on the CNF. These objectives, coupled with market forces, prevent the harvest of the timber on the Chiricahua Mountains. The fuelwood timber resource also provides recreational opportunities for families.

Recreational use has been divided into six types to provide an overview of use on the Coronado National Forest. Representative types include use of general undeveloped areas, recreation residence, developed camping, hunting, dispersed water-based recreation, and picnicking (Table II-8). General undeveloped areas were chosen to represent backcountry or wilderness type use. Recreational residence represents private recreational use. Developed camping includes all general, auto, trailer and tent categories. Hunting includes big game, small game, upland birds, and water fowl. Dispersed reservoir and stream use represent backcountry water-based recreational use. Picnicking was chosen to be representative of day use. The six types depict only certain types of recreational use and therefore figures for each do not sum to the total visitor days in the CNF.

Isn't birdwatching extremely popular in this area of AZ.

General Overview of Recreation Resources by CNF District

Catalina District. The Catalina Ranger District has the highest level of recreational use and the smallest acreage of any district in the CNF. Total visitor days for 1976 were 1,460,600, which was 70 percent of the total visitor days of 2,095,200 on the CNF.

In addition to the Catalina Highway, trails totaling 1,520 acres provide recreational access to the Catalina Ranger District.

All recreational use has increased over the past five years, except picnicking which decreased 12 percent. Hunting increased 173 percent which was the largest change in recreational use (Table II-9).

The Pusch Ridge was added to the wilderness areas of the Coronado which now total 127,177 acres. Its 56,460 acres are comparable in size to Galiuro Wilderness area (See Safford District). Pusch Ridge also has the only resident population of bighorn sheep on the CNF.

Table II-8: Recreational Use
(1,000's of visitor days*)

| | Type 1 | Type 2 | Type 3 | Type 4 | Type 5 | Type 6 |
|-------------------|--------|--------|--------|--------|--------|--------|
| 1973 | 311.3 | 126.5 | 352.4 | 80.4 | 58.2 | 281.7 |
| 1974 | 297.4 | 123.9 | 348.7 | 74.1 | 96.0 | 200.9 |
| 1975 | 291.1 | 123.4 | 383.8 | 70.4 | 95.6 | 266.0 |
| 1976 | 396.7 | 118.7 | 458.6 | 132.2 | 74.9 | 301.2 |
| 1977 | 434.9 | 115.3 | 435.1 | 139.8 | 82.4 | 267.9 |
| 1977 by district: | | | | | | |
| Catalina | 71.4 | 65.2 | 78.6 | 15.6 | 24.54 | 146.9 |
| Safford | 61.9 | 21.0 | 87.5 | 34.2 | 12.36 | 27.3 |
| Sierra Vista | 103.0 | None | 85.8 | 57.2 | 16.51 | 22.3 |
| Nogales | 79.3 | 22.0 | 91.3 | 22.0 | 12.4 | 40.3 |
| Douglas | 119.3 | 7.1 | 92.9 | 10.8 | 16.6 | 31.0 |

Key to Recreational Types:

- 1: General undeveloped areas - All areas not designated as developed.
- 2: Recreation Residence - Private recreational residence on forest land such as Summerhaven.
- 3: Developed Campgrounds - Camping in developed areas
- 4: All hunting - Big game, small game, waterfowl, upland birds
- 5: Reservoir and River and Stream Recreation - dispersed use
- 6: Picnicing - picnicing in developed areas.

* 1 visitor day: 1 or more people using the area or site for twelve hours.

Table II-9: Recreational Use of the Coronado Forest by District

| <u>Catalina District</u> | Type 1 | Type 2 | Type 3 | Type 4 | Type 5 | Type 6 |
|--------------------------|--------|--------|---------|---------|--------|---------|
| 1973 | 57.0 | 51.5 | 66.6 | 5.7 | 21.9 | 167.2 |
| 1974 | 49.2 | 68.7 | 65.5 | 5.4 | 19.6 | 86.2 |
| 1975 | 52.0 | 69.0 | 52.3 | 6.0 | 18.2 | 156.7 |
| 1976 | 57.6 | 57.0 | 57.0 | 7.4 | 19.9 | 186.6 |
| 1977 | 71.4 | 65.2 | 78.6 | 15.6 | 30.5 | 146.7 |
| <u>Net Acres</u> | 188398 | 169 | 215 | 264,192 | 1243 | * |
| <u>1977 Visitor Days</u> | | | | | | |
| Per acre | .379 | 303.3 | 465.1 | .059 | 24.54 | |
| 1973 - 1977 $\Delta\%$ | 25.26% | 26.6% | 18.01% | 173.7% | 39.27% | -12.26% |
| <u>Safford District</u> | | | | | | |
| 1973 | 34.0 | 17.7 | 64.8 | 17.6 | 16.9 | 31.9 |
| 1974 | 37.9 | 18.9 | 66.9 | 19.7 | 17.2 | 28.9 |
| 1975 | 46.6 | 21.0 | 84.6 | 22.9 | 19.4 | 31.9 |
| 1976 | 60.4 | 21.0 | 72.2 | 34.1 | 22.7 | 33.9 |
| 1977 | 61.9 | 21.0 | 87.5 | 34.2 | 25.9 | 27.3 |
| <u>Net Acres</u> | 403737 | 41 | 30 | 390,158 | 2095 | * |
| <u>1977 Visitor Days</u> | | | | | | |
| Per acre | .153 | 512.2 | 2916.67 | .088 | 13.36 | |
| 1973 - 1977 $\Delta\%$ | 82.06% | 18.64% | 35.03% | 94.32% | 53.25% | -14.4% |

* - acreage not available

Table II-9: (continued)

| <u>Sierra Vista District</u> | Type 1 | Type 2 | Type 3 | Type 4 | Type 5 | Type 6 |
|------------------------------|---------|--------|--------|---------|--------|--------|
| 1973 | 103.8 | * | 62.1 | 24.8 | 19.4 | 12.5 |
| 1974 | 94.8 | * | 61.8 | 16.9 | 19.7 | 13.3 |
| 1975 | 94.8 | * | 62.3 | 13.8 | 19.9 | 10.1 |
| 1976 | 101.5 | * | 71.4 | 23.9 | 19.9 | 14.6 |
| 1977 | 103.0 | * | 85.8 | 57.2 | 21.8 | 22.3 |
| <u>Net Acres</u> | 292197 | | 46 | 333926 | 132 | -- |
| 1973-1977 % | -1% | | 38.16% | 130.64% | 12.37% | 78.4% |
| <u>Visitor Days</u> | | | | | | |
| Per acre | .353 | 0 | 1865.2 | .171 | 165.15 | -- |
| <u>Nogales District</u> | | | | | | |
| 1973 | 24.7 | 35.6 | 67.2 | 23.8 | 30.8 | 46.5 |
| 1974 | 22.6 | 31.6 | 67.2 | 23.9 | 32.6 | 41.0 |
| 1975 | 19.9 | 40.8 | 70.6 | 17.8 | 33.0 | 40.3 |
| 1976 | 70.4 | 16.8 | 79.7 | 56.7 | 6.9 | 37.0 |
| 1977 | 79.3 | 22.0 | 90.3 | 54.8 | 6.2 | 40.6 |
| <u>Net Acres</u> | 287100 | 24. | 26.0 | 369,560 | 50 | -- |
| 1973 - 1977 % | 221.05% | -38.2% | 34.38% | 130.25% | -79.1 | |
| <u>Visitor Days</u> | | | | | | |
| Per acre | .276 | 916.67 | 3473.1 | .148 | 124.0 | -- |
| <u>Douglas District</u> | | | | | | |
| 1973 | 75.5 | 6.4 | 81.6 | 6.3 | 7.0 | 25.2 |

Table II-9: (continued)

| <u>Douglas District</u> <u>(continued)</u> | Type 1 | Type 2 | Type 3 | Type 4 | Type 5 | Type 6 |
|---|----------------|------------------|------------------|-----------------|-------------------|--------|
| 1974 | 78.8 | 7.0 | 84.3 | 6.2 | 6.9 | 25.1 |
| 1975 | 92.8 | 7.1 | 80.7 | 7.9 | 5.1 | 23.8 |
| 1976 | 102.7 | 7.1 | 93.6 | 10.1 | 5.5 | 29.1 |
| 1977 | 119.3 | 7.1 | 92.2 | 10.8 | 5.5 | 31.0 |
| <u>Net Acres</u> | 367906 | 14 | 74 | 444,447 | 33 | |
| <u>Visitor Days</u> | | | | | | |
| per acre 1973 - 1977 % | .322 91.29% | 507.14 10.94% | 1245.9 13.85% | .0243 71.43% | 166.67 -21.43% | 23% |

Use is recorded in visitor days = 1 or more people using the area or site for 12 hours.
Reported in 1,000's of visitor days.

* - no activity on district
-- information not available

Water-based developed recreation sites on the Catalina Ranger District sustain high use. Rose Canyon Lake had 25,000 visitor days and Sabino Canyon 78,000 visitor days in 1977.

Nogales District. Madera Canyon and Pena Blanca Lake receive high recreational use. The recreational residence use has decreased 38 percent from 1973 levels in Madera Canyon.

The trail access is 177 acres for the Nogales Ranger District. The district has the second highest amount of hunter use for the CNF.

Sierra Vista District. The Sierra Vista Ranger District has no recreational residences. The district has 470 acres of trails for hiking access. The highlight for this district is the hunter visitor days of 57,200, which is the highest level of hunter use for any district. This may be due to the large number of available wildlife.

Parker Canyon Lake is maintained for fishing, camping, boating, and swimming. Visitor days for this lake were 84,000 in 1977 which represents the highest use of any developed area on the CNF.

Douglas District. The Chiricahua Wilderness, totaling 18,000 acres, is located in the Chiricahua Mountains. Visitor days for the undeveloped areas of this district were higher than any other district. A 90 percent increase has occurred over the past five years. Hiking access is provided by 741 acres of trails in the district's mountains.

Rucker Lake provides recreational use similar to that at Parker Canyon Lake, including fishing, boating, and camping. Visitor days totaled 23,700 for the three developed camping sites at Rucker Lake.

Safford District. General access is provided by two paved roads into the Pinateno Mountains. The road originating on the eastern slopes and terminating at Riggs Lake provides the best access to the Pinaleño Mountains. Riggs Lake has the highest use for a developed site on the district and provides a recreational experience similar to that provided by Rucker Lake except that it is higher in elevation. The demand for water-based recreation at Riggs Lake is higher than any other campground in the Pinaleños (Bisson and King, 1974).

The Galiuro Mountains have a 52,700 acre wilderness area with an access corridor down the center of the wilderness. This wilderness area is 40 percent of the total wilderness acreage for the CNF, but receives less dispersed use than the forest's other two wilderness areas.

THE DEMANDS FOR CORONADO NATIONAL FOREST RESOURCESThe Public Involvement ProgramFederal Agency Decision-making and Public Accountability

One of the most significant political and governmental developments of the present decade has been the growth and intensification of public attention to the planning, program, and decision-making activities of federal agencies. Increasingly, informed members of the public no longer misunderstand the role of the bureaucracy to be purely that of a neutral agent passively and objectively administering or implementing policies at the behest of congress and the president. Rather, they have come to understand the bureaucracy as an important initiator of substantive policy decisions. Much of this heightened awareness is the result of several years of highly publicized conflicts involving agencies, their traditional clientele, and a new set of public interest groups seeking to participate in agency decisions. For the past decade, consumer and environmental interest groups have been the most conspicuous of these new groups spearheading efforts to gain access to and exert influence on agency decision-makers. Many agencies have found themselves ill-equipped to readily handle these new demands for participation. But, unable to ignore these pressures, they have been obliged to develop new mechanisms to accommodate public involvement in the hope of reducing the conflict and uncertainty which have burdened agency decision-makers.

These circumstances can be generally understood as manifestations of a reaction to the long-standing trend of congressional and presidential abdication of many traditional responsibilities for initiating and overseeing the implementation of programs in several areas of domestic policy. Simultaneously, the federal bureaucracy has gradually assumed a broad range of policy-making duties and has emerged as a relatively strong center for making substantive policy decisions independently of elected officials and the general public. This situation has oftentimes left many federal agencies chiefly accountable to and dependent upon a coterie of well-established special interest groups.

To the extent federal agencies have assumed responsibilities and authority formerly the preserves of elected officials, the mechanisms for public accountability have correspondingly been circumscribed. While external checks on the activities of elected officials are often quite limited, they at least include the opportunity for the public to vote for office-seekers, to be notified and informed of legislation being considered, and to participate in public hearings. Such internal checks as provided by debate and opposition, deliberation and compromise to accommodate conflicting interest, and the building of a legislative record with supporting reasons are also present. As inadequate as these checks might be, few such analogous opportunities for public involvement and accountability in agency decision-making have existed until recently.

The severing of linkages between public control and policy-making authority

has in many instances gone unnoticed by the general public, but in others it has given rise to conflicts and uncertainties which have provoked the concern of both agencies and activist members of the public. Probably more than any other area of public policy, natural resource and environmental policies are most responsible for, or at least most closely associated with, the emergence of a plethora of theories and practices of public participation in federal agency decision-making. The most important catalyst stimulating the search for new mechanisms to involve the general public in agency activities has been the National Environmental Policy Act of 1969 (NEPA). Despite several shortcomings evidenced by the nearly nine years of experience with NEPA, many issues of agency accountability to the public have been exposed and grappled with because of the Act, and especially because of some uncharacteristically broad interpretations of NEPA's requirements by the courts. In response to NEPA, federal agencies have sought, with varying levels of commitment, to develop new procedures for facilitating public participation in their decision-making processes. Most agencies, especially those with responsibilities relevant to managing and developing natural resources, have learned if they do not recognize the need to cultivate at least (but sometimes more than) the appearance of being open to public involvement, the legitimacy of their activities can be significantly compromised and their ability to implement decisions seriously curtailed. The public (insofar as it is represented by individual activists and a variety of economic, social, and political interest groups) has learned that effective participation in agency activities requires the development of tactics and strategies, the attainment of knowledge, and the application of political and organizational resources which differ significantly from what is required to mobilize voters or otherwise participate in the processes of legislative bodies.

The U.S. Forest Service has been among those agencies in the forefront of the movement toward developing new techniques of public involvement. Forest Service efforts to come to grips with the complexities of the public involvement question predated NEPA by several years, and since NEPA's passage have accelerated beyond the efforts of most other agencies. Although differences in philosophy and approach can be found across Forest Service regions and individual forests, the agency as a whole retains a strong commitment to continued development of appropriate means to involving the public in its decisions. The adoption of an ambitious public participation program by the Coronado National Forest (CNF) as an important component of its recently initiated forest-wide land management planning process further attests to this ongoing commitment.

Public Involvement and the CNF Forest-wide Land Management Planning Process

While the presence of NEPA and previous Forest Service experience with public involvement programs are strongly felt in the CNF's design and implementation of a public involvement program, the more immediate statutory and regulatory bases for the entire planning process are provided by the National Forest Management Act of 1976 and regulations recently promulgated under the Act (Forest Service/USDA, 1976; 1978).

In keeping with the spirit of NEPA, the Forest Management Act, and Forest Service policies and regulations, the CNF has established as one objective of its land management planning effort a process which is as open as possible and which emphasizes maximum interaction with and participation by the public. The public, "just like the Forest Service people involved," asserts the CNF, "will do tasks to help complete the planning process." Their job will be "to provide information, suggest analyses, and monitor the planning as it progresses" (Coronado National Forest; 1978, p.14).

The CNF has conceived the process of formulating its Forest Land Management Plan (FLMP) as having five main phases, all of which include plans for some form of public involvement. The first phase, Issue Identification, has been substantially completed. During this phase the CNF identified, through a series of public involvement activities "the concerns, wants, problems that should be dealt with during the rest of the planning process" (Coronado National Forest; 1978, p.14). Work is currently (Feb. 1978) underway on developing possible solutions for the issues identified during phase one. During this second, Issue Strategies, phase, solutions are being formulated within the bounds of what the forest can supply. These solutions will provide the basis for developing management alternatives. The third phase, Alternative Development, will be devoted to combining the solutions identified into feasible alternative management strategies, explaining why other alternatives were rejected as not feasible, and producing a draft environmental impact statement. The draft statement will be reviewed and commented upon by other government agencies and the public pursuant to NEPA requirements, Council on Environmental Quality regulations and guidelines, and Forest Service procedures. A preferred choice among the alternatives developed in phase three will be made during the fourth phase of Plan Development. A management direction which seems best will be developed and presented in a final impact statement and a FLMP document. Finally, following completion of the impact statement review process, the CNF will embark on carrying out the task actually implementing the plan. Detailed public involvement activities beyond the first phase have not as yet been substantively spelled out beyond plans to maintain contact with other government agencies, distribute to the public a Forest Feedback tabloid summarizing the planning efforts (thusfar, two numbers have been issued), and perform the obligatory tasks involved in dealing with review comments received concerning the environmental impact statements.

Issue Identification and Public Involvement

Public involvement has played an integral part in completing the Issue Identification phase of the FLMP process. The major purposes of the participation program in that initial planning phase were to identify the groups and individuals who would comprise the agency's constituency throughout the planning process and to identify public perceptions of the entire range of issues regarding the management of Coronado National Forest land. The CNF sought to identify as wide an interested public and its many areas of concern as possible, but without necessarily associating concerns with particular interest groups and individual political activists; nor was discerning the potential intensity of any issue of primary importance. The CNF also sought to avoid designing its participation program to be a plebiscite-like exercise. These objectives and

considerations were regarded as necessary for maintaining an unbiased and open planning process.

In order to accomplish the principal aims of the participation program, public input was solicited primarily by means of five mechanisms (or instruments) administered by mail and through a series of twelve public forums held in eleven communities in southeastern Arizona. Through various response forms and discussions, information was solicited from the public which provided a general profile of the sources and types of demands on the Forest which should be dealt with by management plan.¹

Who Participated?: Toward Defining the CNF Constituency

The identification of sources of demands on the forest began with the compilation of a mailing list of about ten thousand entries compiled from the CNF mailing list, several directories, and other sources.² Included within this master list were three sub-inventories of political, social, cultural, economic and other special interest groups and associations; local, state, and federal planners and planning bodies; and local, state, and federal agencies, government bodies, and officials. A postcard response form was mailed asking recipients to indicate general topics and areas of interest.³ The response rate to this mailing, though not yet precisely known as cards still continue to arrive on a daily basis, was about twenty percent.

Preliminary figures indicating the response to the mailing by special interest groups and associations are presented in Table II-10. An equivalent tabulation of responses from the other two sub-inventories is not shown, but preliminary findings thus far indicate a substantially lower rate of response than achieved by the interest groups. The participation of planners has been further solicited by a recent mailing of the general planning document, and a letter requesting comments, designation of a liaison officer, further identification of issues, and a description of planning activities which might be related to the CNF planning process. Some consideration has been given to publishing an organ devoted to promoting interaction among planners, and thereby encouraging their involvement in, or at least awareness of, the planning process. However, no commitment to do so has yet been made. In any event, it is expected that the participation of planners and government bodies will be accomplished through means other than those provided for the general public.

A major source of information permitting the CNF to define further its constituency within the general public was provided by a series of public planning forums. A total of 490 people attended the twelve forums. The location and number of people attending each forum are in Table II-11. Further indications of the profile of these participants are shown in Tables II-12 and II-13. Table II-12 shows the tabulations of responses to a card distributed to forum attendees. The response rate to the card was 77.5% (N=380). Table II-13 provides an indication of the composition of each forum based on how participants identified themselves as users of the forest.

From the figures shown in Tables II-10 through II-13, a number of general conclusions about the composition of participants can be drawn. First, from a purely quantitative viewpoint, the most significant component of this clien-

tele sector is environmentalists. For example, Table II-10 indicates that while environmental groups represented only a small percentage of all groups contacted by mail (2.1%, less than for all but three categories), the response rate of environmental groups (52.4%) was by far greater than for any other group category. The second highest response rate came from farm and ranch groups (33.3%). Also, the proportion of all responses accounted for by environmental groups (10.4%) relative to the proportion of environmental groups indicates the highest disproportionate ratio among all groups. Furthermore, as shown in Table II-12, more individuals who participated in the forums identified themselves as "environmentalists" than any other category except "taxpayer" and "interested citizen." In Table II-13, which includes only self-identification categories of forest users, more individuals identified themselves as environmentalists than any other category at six of the twelve forums. Ranchers, permittees, and hunters were the dominant participants at five of the forums, and birdwatchers predominated at the forum in Green Valley. These findings are obscured by the fact that multiple responses to the self-identification categories were permitted. Finally, the relatively high turnout for the forum held in Portal (See Table II-11), where the Cave Creek issue is highly salient, is indicative of the high interest forums held for environmentalists.

The identification of interested groups and individuals comprising one sector of the CNF's constituency for the FLMP is only one component among several necessary to determine demands upon forest resources relevant to management practices regarding the allocation of forest land. For a more complete understanding of demands, a variety of additional data were collected and analyzed as part of the public involvement program in order to determine public perceptions of forest uses, issues facing or likely to face forest management, and realistic and ideal future conditions on the forest.

Uses for CNF Resources Identified through the Public Involvement Program

From the comments and opinions received from mailed response forms and the public planning forums, a total of 114 uses of the forest were identified. There uses were then categorized as recreational, resource, special, and educational. Fifty-three recreational uses, twenty-one other major resource uses, twenty-three special uses, and seventeen educational uses were identified. The major identified uses, and, for some uses, the frequency with which each use was mentioned in written responses and forum discussions are shown in Table II-14. These data are supplemented by the top uses identified at each general forum, as shown in Table II-15. Analysis of the data indicates a far greater recognition of recreational uses than of any other uses. Only four uses (birdwatching, hiking, grazing, and mining) were brought up at all twelve forums. Birdwatching, research, hiking, and camping were the uses most often mentioned by participants.

Table II-10: A Profile of Groups Solicited By Mail to Participate in Total Forest Land Management Plan

| <u>Group Categories</u> | <u>Number of Grps. Contacted</u> | <u>Pct. of all Groups</u> | <u>Number Responded</u> | <u>Pct. of Grp. Responding</u> | <u>Pct. of all Responses</u> |
|-------------------------|----------------------------------|---------------------------|-------------------------|--------------------------------|------------------------------|
| Labor | 39 | 3.9% | 4 | 10.3% | 3.7% |
| School Service | 11 | 1.1 | 1 | 9.1 | .9 |
| Fraternal | 55 | 5.5 | 0 | 0 | 0 |
| Sports | 36 | 3.6 | 7 | 19.4 | 6.5 |
| Political | 25 | 2.5 | 2 | 8.0 | 1.9 |
| Veterans | 49 | 4.9 | 4 | 8.1 | 3.7 |
| Youth | 22 | 2.2 | 4 | 18.2 | 3.7 |
| Professional | 66 | 6.6 | 4 | 6.1 | 3.7 |
| Church | 51 | 5.1 | 4 | 7.8 | 3.7 |
| Service Clubs | 125 | 12.5 | 12 | 9.6 | 11.2 |
| Hobby | 189 | 18.9 | 21 | 11.1 | 19.6 |
| Farm & Ranch | 6 | .6 | 2 | 33.3 | 1.9 |
| Literary-Art | 35 | 3.5 | 1 | 2.9 | .9 |
| School Fraternities | 17 | 1.7 | 0 | 0 | 0 |
| Nationality/State Clubs | 35 | 3.4 | 2 | 5.7 | 1.9 |
| Senior Citizen | 22 | 2.2 | 3 | 13.6 | 2.8 |
| Social-Health Services | 97 | 9.7 | 9 | 9.3 | 8.4 |
| Environmental | 21 | 2.1 | 11 | 52.4 | 10.4 |
| Homeowner | 89 | 8.9 | 14 | 15.7 | 12.1 |
| Business | 11 | 1.1 | 2 | 18.1 | 1.9 |
| Miscellaneous | 1 | .0 | 0 | 0 | 0 |
| TOTALS | 1002 | 100.0% | 107 | 10.7% | 98.8% |

Groups not directly solicited, but from whom responses were received

Table II-11: Public Participation Forums--
Location and Attendance

| <u>Forum Location</u> | <u>Forest District</u> | <u>Participants</u> |
|-----------------------|------------------------|---------------------|
| Catalina | Catalina | 7 |
| Tucson | Catalina | |
| Forum 1 | | 36 |
| Forum 2 | | 79 |
| Sierra Vista | Sierra Vista | 50 |
| Patagonia | Sierra Vista, Nogales | 32 |
| Arivaca | Nogales | 16 |
| Nogales | Nogales | 18 |
| Green Valley | Nogales | 14 |
| Douglas | Douglas | 62 |
| Portal | Douglas | 128 |
| Wilcox | Douglas, Safford | 20 |
| Safford | Safford | 28 |
| | | <u>490</u> |

Table II-12: Notification, Self-Identification
and Race of Forum Participant's*

| <u>How Participants Heard About the Forums</u> | % (rounded) |
|--|-------------|
| Mailed Invitation | 45% |
| Friend | 43 |
| Radio | 13 |
| Organization Newsletter | 19 |
| Television | 1 |
| Newspaper Story | 15 |
| Newspaper Advertisement | 7 |
| Poster | 8 |

Total does not equal 100% due to multiple responses

| <u>Self-Identification</u> | % (rounded) |
|----------------------------|-------------|
| Taxpayer | 75% |
| Interested citizen | 80 |
| Racher | 21 |
| Birdwatcher | 29 |
| Forest Service Permittee | 22 |
| Miner | 5 |
| Environmentalist | 38 |
| Government Official | 6 |
| Hunter | 22 |
| ORV Enthusiast | 10 |
| Forest Service Employee | 3 |
| Other | 30 |

Total does not equal 100% due to multiple responses

| <u>Ethnicity/Race</u> | |
|-------------------------|------|
| Mexican - American | 2% |
| Black | 0 |
| Anglo | 62 |
| Other or did not answer | 36 |
| TOTAL | 100% |

* (N=380)

Table II-13: Self-Identified Forest Users by Forum

| <u>Users</u> | Tucson 1 | Tucson 2 | Catalina | Sierra Vista | Patagonia | Ariavaca | Nogales | Green Valley | Douglas | Portal | Willcox | Safford |
|------------------|----------|----------|----------|--------------|-----------|----------|---------|--------------|---------|--------|---------|---------|
| Rancher | 7% | 7% | 43% | 11% | 63% | 40% | 21% | 6% | 25% | 24% | 31% | 26% |
| Birdwatcher | 27 | 23 | 71 | 42 | 30 | 13 | 29 | 50 | 23 | 35 | 6 | 13 |
| Permittee | 10 | 10 | 14 | 13 | 63 | 40 | 14 | 13 | 38 | 16 | 31 | 39 |
| Miner | 10 | 6 | 29 | 2 | 0 | 20 | 0 | 6 | 3 | 0 | 0 | 9 |
| Environmentalist | 55 | 55 | 86 | 47 | 30 | 13 | 36 | 19 | 18 | 39 | 19 | 17 |
| Hunter | 13 | 28 | 43 | 24 | 15 | 40 | 0 | 6 | 30 | 12 | 50 | 39 |
| ORV Enthusiast | 13 | 16 | 14 | 20 | 4 | 27 | 0 | 0 | 0 | 3 | 13 | 9 |

Totals do not equal 100% for each forum due to multiple responses.

Table II-14: Major Uses Identified

| <u>Uses (N=114)</u> | <u>Number of Times Mentioned</u> | <u>Number of Forums where mentioned</u> |
|-----------------------|----------------------------------|---|
| Recreation (53) | | |
| Birdwatching | 74 | 12 |
| Hiking | 47 | 12 |
| Camping | 42 | 11 |
| Nature Study | 35 | 4 |
| Sightseeing | 21 | 4 |
| Wildlife Observation | 20 | 5 |
| Hunting | 18 | 11 |
| Picnicking | 18 | 10 |
| Photography | 17 | 10 |
| Backpacking | 12 | 9 |
| Fishing | 11 | 10 |
| General Recreation | 14 | 8 |
| Solitude | 9 | 9 |
| ORV | 9 | 8 |
| Horseback Riding | 7 | 9 |
| Non-recreational (21) | | |
| Grazing | 17 | 12 |
| Fuel-wood cutting | 15 | 11 |
| Mining | 13 | 12 |
| Watershed | 10 | 8 |
| Timber | ? | 6 |
| Special (23) | | |
| Live in Forest | ? | 4 |
| Wilderness | ? | 3 |
| Unspecified | ? | 4 |
| Educational (17) | | |
| General Research | 71 | ? |
| Flora | 5 | ? |
| Fauna | 11 | ? |
| History | 3 | ? |
| Life-zone | 3 | ? |
| Caves | 1 | ? |

Table II-15: Top Uses by Forum.

Meeting Location

| | | | |
|--------------|---|----------|--|
| Douglas | grazing, camping, recreation, hiking, picnicking, fuelwood gathering, hunting, research quest for solitude | Catalina | hiking, study/seclusion/relaxation, birdwatching, jogging, living in the forest |
| Willcox | grazing, recreation, wildlife, woodcutting, resource conservation | Tucson | recreation, grazing, watershed, wildlife, habitat, mining, preservation, scenic beauty, research, ORV, teaching, solitude, water pollution |
| Safford | grazing, fishing, hunting camping, fuelwood gathering, summer cabins | | |
| Portal | Cave Creek | | |
| Arivaca | grazing, mining, bees, woodcutting, watershed, multiple use, hunting | | |
| Nogales | natural habitat, nature appreciation, camping photography, grazing, wildlife management, hunting, fishing | | |
| Green Valley | watershed, education, hiking, rest and relaxation, grazing, camping, picnicking, photography, birdwatching | | |
| Patagonia | grazing, watershed, wildlife, education, wood-gathering, mining, hunting, fishing, trailriding, hiking, camping | | |
| Sierra Vista | natural habitat, recreation, grazing, hiking, hunting, wildlife observation | | |

Competing Demands for CNF Resources:
Issues Identified Through the Public Involvement Program

A final component involved in ascertaining public demands for Forest resources consists in determining potential competition and conflicts among demands. A compilation of public opinions and supporting reasons gathered during the first phase of the public involvement program produced a list of 107 issues identified by the public. Forty-six of these issues were classified as "Operational" or "Organizational" issues and were set aside to be dealt with outside of the FLMP. Sixty-one issues were classified as "Land Management Plan" issues and will be further analyzed and evaluated during subsequent phases of the planning process. Management plan issues were further categorized under the following topics: Forest products, roads and trails, land ownership, wildlife, fire, range, special areas, water, vegetation, law enforcement, wilderness, recreation, minerals, soils, and operational. A list of the thirty-eight issues produced by the CNF analysis efforts that will be used to produce issue strategies during the second major phase of the planning process is reproduced in Table II-16.

The issues listed in Table II-16 are Forest-wide issues. More detailed information on public perceptions of issues to be dealt with in the FLMP is found in Table II-17, where the results of a ranking of priority issues by planning forum participants are shown. Across the entire Forest, priority issue areas appear to be, in order: access to the Forest, ORV control, mining damages, overgrazing, education, and grazing. The issue area which may hold the greatest long-term impact for the Forest and over which the CNF will probably have the least control is mining. All of the mining related issues ranked by the forum participants are displayed in Table II-18.

The final area of public input for which data has been gathered and some analysis performed by the CNF concerns public beliefs about realistic and ideal futures for the Forest. Analysis and evaluation of this data is expected to provide a basis for a deeper understanding of public values and demands to be dealt with in the FLMP, and will be used along with information about Forest users, uses, and issues as an important basis for developing issue strategies. A total of 279 separate (but many closely related) components of an ideal future, and 184 components of a realistic future were recorded. In Table II-19 all components of beliefs about ideal and realistic Forest futures which were brought up at more than one forum and the number of forums at which they were mentioned are listed. An examination of the list reveals potentially significant discrepancies between ideals and realistic expectations for nearly every topic, therefor indicating possible future areas of conflict.

Conclusion

The CNF, through a well planned and executed public involvement program, has succeeded in initiating and maintaining contact with large number of various groups and individuals interested in the FLMP and soliciting their input to the planning process. In so doing, the CNF has received some substantive information about a portion of its constituency and about constituent perceptions of present and future forest uses and issues. No doubt, for the planners, District Rangers, and other personnel who organized and observed the

TABLE II-16: Forest Issues Identified
for Land Management Planning

FOREST PRODUCTS

The issue is, to whom (citizen/non-citizen) and what type of (personal/commercial) forest products permits should be issued.

The issue is, which harvest techniques/silvicultural systems for wood (timber and fuelwood) should be used on the Coronado National Forest (clear cut, snag policy, reforestation, green/dead wood).

The issue is, how much, where and for what objective should timber be harvested in the Forest.

The issue is, should Christmas tree sales be made and where.

ROADS AND TRAILS

The issue is the level of road and trail maintenance and standards for existing and new roads and trails, where and how many (Transportation Plan).

The issue is, how to resolve the conflicts between trail users (hikers, horseback, motorcycles).

The issue is, what kind of and how much public access to special use areas.

The issue is, adequate (for peak periods of use), legal, public access to and within the Forest that is environmentally acceptable and safe (roads and trails, stock tank maintenance, fuelwood cutting, bird watching, hunting, etc.).

LAND OWNERSHIP

The issue is, where and what kinds of land (private, state, etc.) should be acquired within the National Forest boundaries and which lands should be exchanged out of the National Forest System.

WILDLIFE

The issue is, a question of allocation of time and effort to threatened species in relation to other flora and fauna.

The issue is, should other uses (mineral entry, recreation, etc.) be controlled in critical wildlife habitats.

The issue is, should Cave Creek be designated as a National Zoological Area or a wildlife management area, and how other uses should be integrated in the decision, or should it remain unclassified.

The issue is, where and how many fishing lakes should be in the Coronado National Forest?

The issue is, how much and where should wildlife resources and habitat be maintained for future generations; which species (beargrass habitat-javelina).

The issue is, where and how many areas should be designated as unique and critical wildlife habitats, research natural areas, and how they are to be managed.

The issue is, how much, where and why predator and rodent control should happen.

The issue is should we reintroduce native wildlife and/or historical habitats (includes Threatened and Endangered Species).

FIRE

The issue is, how much and what kind of (prescribed, man-caused, natural) fire should be allowed to burn, where, at what time of year, intensity, and how much private property/development protection should be provided.

RANGE

The issue is, how much and where should Forest land be allocated for grazing and what relation does this bear to other uses (conflict between grazing and recreation), etc.

The issue is, the allocation of forage between grazing and wildlife.

SPECIAL AREAS

The issue is, where and how many utility corridors, commercial developments, access to inholdings, summer homes and apiary sites, etc., should there be.

The issue is, what archeological and historical sites should be nominated to the National Register of Historic Places.

The issue is, to what degree should archeological and historical sites be interpreted to the public.

The issue is, the allocation of management policies to enhance scientific research values.

WATER

The issue is, how the water produced on the Forest will be used.

The issue is, how should streams be classified as to use which implies the water quality standards they have to meet.

VEGETATION

The issue is, where and how much vegetation manipulation should be done on the Coronado National Forest.

The issue is, how to allocate uses in riparian areas (e.g., fencing, grazing system).

The issue is, whether or not to use non-native species for revegetation.

LAW ENFORCEMENT

The issue is how much regulation and where.

WILDERNESS

The issue is, how much wilderness and where it should be (after RARE II).

The issue is, the difference in intensity of management in the different wilderness areas regarding recreation, wildlife, resources, grazing and fire management policies.

RECREATION

The issue is, where are the caves and to what kinds of uses should they be allocated and how can they be managed (recreation, scientific, wilderness).

The issue is, where and how much land should be allocated for developed recreation (picnic/campgrounds) and which lands should remain undeveloped for dispersed recreation.

The issue is, where to provide for visual resource integrity.

The issue is, should the present ORV plan be revised and how.

MINERALS

The issue is, under what circumstances should an area be withdrawn from mineral entry.

SOILS

The issue is, how much and where accelerated erosion should be tolerated.

OPERATIONAL

The issue is, how much and what kind of law enforcement.

TABLE II-17: Issue Rankings for Each Forum

| <u>Forum</u> | <u>Issues and Ranking Scores*</u> |
|--------------|--|
| Douglas | Recreational Use v. Grazing (49), Control of ORV Misuses (41), ORVs v. Erosion (33), Traffic Control (30), Access (29), Grazing v. Wildlife (28), Limited Woodcutting v. Fuel Problem (27), Good of the Forest v. People (25), Education (25), Cave Creek (23), Special Designation for Cave Creek (22) |
| Portal | Woodcutting (47), Preservation of Natural Resources (46), Grazing (41), Anti-Hunting (40), Grazing (41), Carrying Capacity (35), South Fork (30), People/Vehicle Use v. National Research (27), Changes due to Human Impact (24), Too Many Changes (23), People v. Habitat (20) |
| Willcox | Uneducated Public v. Permittees (25), Conservation (25), People Impact v. Natural Resources (19), ORV Control (19), Uneducated Public (18), Interagency Conflicts (17), Forest Service v. Users (16) |
| Safford | Wildlife Habitat Preservation (32), Increased recognition of Permittees' Rights (25), Local v. National Control (23), All Forest Users should Pay for Use (20), Better Uses of Deadwood (20), Permit Fees Too High (16), Vehicles v. Grazing |
| Arivaca | Better Roads (23), Some Allotments not Justifiable (23), Recreational Use v. Environmental Restrictions (22), Restrict Camping to Designated Places (17), Group Responsibility in Forest Use (17), Forest Employees Move Too Much (14), Recreation v. Mining, Timbercutting (13), All Forest Users Should Pay for Use (12) |
| Nogales | Mining Damages (31), Traffic Control (21), Timber (20), Water-shed Control (17), Hunting (16), Overgrazing (16), Wilderness/RARE II (15) |
| Green Valley | Vandalism (29), Education (22), Wildlife Protection Areas (18), Recreation v. Mining, Grazing, Timbercutting (18), Better Planning Process (16), Control of ORV Misuse (16), Resource v. Recreation (15) |
| Patagonia | Economics v. Leisure Time (68), ORV Misuse (44), Lack of Respect for Property and Nature (35), Education (31), Grazing Fees (23), Mining Damages (22) |
| Sierra Vista | Access (45), Woodcutting (42), Wilderness/RARE II (40), Control of ORV Misuse (38), Erosion Increase (35), Wildlife Protection Areas (32), Safety Education (24) |
| Tucson 1 | Wildlife Habitat Preservation (38), Proper Grazing v. Overgrazing (32), More Environmental Education and Public Involvement |

(31), Overuse of Critical Areas (28), Access (20), Water Management (19)

Tucson 2 Overgrazing (43), Recreation v. Production (40), Better Drainage and Road Maintenance (35), Wise Recreation (30), Preservation (29), Preservation v. Conservation (29), Wildlife v. Production (28), Carrying Capacity (28), Wildlife Habitat Preservation (27), ORV Misuse (26), 1872 Mining Law (25), Mining Damages (23)

Catalina Land Exchange (20), Mining Damages (16), Use of Public Land Permit for Profit (13), Overgrazing (10), Include Oracle and Pinal County in Forest Service Planning (10), Camping v. Over Population (9)

* Scores arrived at by multiplying frequency of mention times priority level (top priority = 5; second priority = 4, etc.)

Table II-18: Forum Participants' Ranking of Mining Issues

| <u>Issue</u> | <u>Forum and Ranking Score</u> |
|--|---|
| Mining Damages | Nogales (31), Tucson 2 (23), Patagonia (22), Catalina (16), Sierra Vista (13) Wilcox (6), Tucson 1 (5) |
| Recreation v. Mining, Grazing, Timbercutting | Green Valley (18), Arivaca (13) |
| 1872 Mining Law | Tucson 1 (7), Tucson 2 (25) |
| Better Mining Regulations | Nogales (4), Tucson 1 (4) |
| Use of Public Land Permits for Others' Profit (Wood, Mining, etc.) | Catalina (13) |
| Unsafe Mine Shafts | Nogales (12) |
| Mining Interests v. Individual Effort | Tucson 2 (1) |
| Strip Mining | Sierra Vista (3) |
| Mining v. Wilderness | Douglas (7) |
| Mining v. Natural State | Sierra Vista (5) |
| Limit Mineral Development | Douglas (3) |

TABLE II-19: Future and Ideal Realities
Identified by Forum Participants

TOPIC

| | | |
|-----------------|--|---|
| Access/Vehicles | More paved road (4 Forums) More and larger roads (4) More vehicle use (3) More problems in accessible areas (3) Restrict travel, auto use (2) Less accessible (2) More ORV destruction (2) | No ORVs (6 Forums) More access into forested areas (4) Fewer roads (4) More trails (4) No more new roads (3) Better maintained roads (3) Fewer ORVs (3) More control on ORVs (3) Better access (2) Controlled access (2) Better trail marking (2) Better trail management (2) Restricted use of vehicles (2) No vehicles (2) |
| Recreation | Controlled entry, permit system, reservations for sites (9) Increased public pressure for recreation (3) Increased demands for use (3) Over recreated (2) Recreation will outweigh commercial and other uses (2) | More campgrounds, recreation areas, and picnic areas (6) |
| Mining | Increased mining (5) | No mining (3) Better mining regulations (2) |
| Grazing | Overgrazed (4) Controlled grazing (4) No grazing (4) Less grazing (4) Fewer Ranchers (2) | Continued grazing (4) Better grazing management (3) No cattle (2) Less brush, more grass (2) |
| Timber | Less timber (3) Increased timber/wood cutting (3) Less woodcutting will cause fires (2) | Maximum utilization of timber (2) More selected woodcutting (2) Cleanup of woodcutting areas (2) Better management and regulation (2) Cut wood--less controlled burn (2) |

TABLE II-19, continued

| | | |
|---|--|---|
| Resource preservation/restoration/ enhancement | Remain same (5) More garbage (3) Solid development around forest (2) Conserve natural resources (2) Erosion problem continued (2) | More erosion control (3) Less destruction (2) Preserve the forest (2) |
| Multiple Use | Remain multiple use/sustained yield (3) Will not remain multiple use (2) | Continue multiple use/sus- tained yield (8) Continue multiple use with reservations (3) Man's errors corrected (3) Better resource inventory (2) Rotate land use (2) Better land management (2) |
| Special uses | Increased commercial use (3) | Each user should pay their way (2) |
| Wilderness | More wilderness (3) No wilderness, usurped by others uses (2) | More wilderness (8) Completely natural forest (6) Maintain wilderness (2) Educated wilderness users (2) |
| Forest Quality | Overpopulated, crowded (7) Gradual destruction (3) Over-exploited (3) Dust bowl, total destruction (3) More pollution (2) Environmental degradation (2) Still beautiful (2) | Remain the same (9) Less littering, no litter (8) Less pollution (5) Hold our ground as we are now (4) Better cleanup of litter (2) Pack in; pack out litter (2) |
| Water | Water shortage (4) Watershed deterioration (2) More water pollution (2) | Control water pollution (3) More water developments (2) |
| Wildlife | Less wildlife (7) More damage (3) No wildlife (2) More trampling (2) Habitat destruction (2) | More animals (4) More big game (4) Better wildlife management (3) Protect unique wildlife hab- its (3) More wildlife protection (2) Improved wildlife habitat (2) |

TABLE II-19, continued

| | | |
|---|---|--|
| | | Increase bird and wildlife refuges |
| Fire | | More prescribed fires (5) Natural fire policy (3) Less controlled burn (2) |
| People | Less appreciation of natural beauty (2) | |
| Forest Service operations/mngmnt/ personnel | More law enforcement restrictions, regulations (7) Too much control (2) More congressional control (2) Over-managed, over-controlled (2) More bureaucracy (2) Higher user fees (3) | More personnel in field, not office (6) Better law enforcement (4) Better enforcement of existing policies (4) More law enforcement on highways (3) Recognize carrying capacities (3) Less restrictions (2) More local control (2) Better signs (2) Revenue to improve forest (2) Financially self-supporting (2) Historical sites preserved (2) |
| Public Education and Involvement | | More environmental education (5) Better informed public (3) Education of wilderness users (2) |
| Land Ownership | | Acquire more land (especially those traded in 1962) (2) Return lower elevation, non forested land to private land (2) |

program, the direct involvement with the forums and other modes of public input provided a subjective experience which cannot meaningfully be quantified, documented or otherwise expressed in some formal or objective manner. Drawing conclusions about the meaning and quality of this subjective information is beyond the scope of concern here. Rather, we are concerned only with the tabulated results of the formal process of gathering information from the public, and what these results seem to indicate about demand for forest resources and issues potentially facing the CNF. Some indication of the District Rangers' feelings about the program are indicated elsewhere in this report.⁴

The CNF public involvement program, as it has thusfar been carried out, appears to conform to both the spirit and letter of the land management plan regulations and to the intentions of CNF land management planners. Nevertheless, it would be a mistake to consider the results of the program as providing complete, or even near-complete, information about public demand for CNF resources. Most of the information generated by the forums was at a high level of generality and, for the most part, was already known to the CNF. Furthermore, the forums yielded little additional information about either the intensity or source of demands, or the potential for demands to provoke conflict or the emergence of political issues.

Keeping these limitations in mind, what general conclusions about demand and issues do the tabulated results permit to be drawn? For one thing, the modes of public input employed attracted a cross section of forest users which should not be mistaken as a cross section of the general public. Among the major interests which comprise the CNF's constituency, environmentalists, it seems, were the most attracted to the public involvement program. The level of environmentalist participation may be, but probably is not, a measure of their relative importance among all CNF constituents. Other more significant and potent interests possess a level of political resources far greater than typically enjoyed by most local, or even national, environmental groups, and prefer to rely on modes of input other than public participation exercises.

A second general conclusion is that participant's perceptions of forest uses were heavily weighted toward recreational activities such as birdwatching, hiking, and camping. Also, the desires of participants, expressed as a future ideal, gave some indication of a demand for improvement of recreational opportunities. Not surprisingly, the issues perceived by forum participants were often framed in terms of a conflict between recreational uses and other uses such as grazing or mining.

The program's greatest value may have been its fulfillment of a public relations function. As such, it may have contributed to building a foundation of public support for the CNF land management plan that might also be transferred at a later time to more specific CNF decisions and actions. If so, then whether or not this source of support can be successfully drawn upon at a later time will depend in great part upon the CNF's willingness and ability to continue programs of regular public contact.

NOTES

1. The following instruments were used by CNF to gather information from the public:

Instrument 1:

A postcard response form requesting recipients to indicate topics and areas of interest from choices provided under the headings of "Information Services" (environmental education, visitor services, fire prevention and outdoor education), "Program functions" (range, recreation, timber, soil and water, wildlife, land uses, minerals, fire, insect and disease, engineering, RPA national planning, regional and forest planning, plan implementation, environmental impact statements) and "Areas" of the Forest (Chiricahua, Dragoon, etc.). Recipients were also asked if they were willing to distribute informational materials. Responding organizations were asked if they were willing to accept articles for their newsletters and to provide mailing lists.

Instrument 2:

A four item response form mailed to those who normally received Forest Service environmental impact statements. Recipients who would be unable to attend the forum were asked to respond in writing to the following four items:

- A. At this time, we are seeking initial information about issues on the Coronado National Forest, in order to know more about what's happening now and to consider trends in the future. Some of the major activities people participate in are hiking, picnicking, mining exploration, fuelwood gathering, camping, and birdwatching. Obviously, there are many more activities. Feel free to comment on those mentioned and add others that you feel should be considered.
- B. Over the years situations change and activities in and uses of a National Forest vary. Projections include larger populations with more leisure time. Picnicking and camping in motorized vehicles are expected to increase and fuelwood gathering will become more popular as energy costs go higher. Other activities and uses are changing as well. Please comment on these trends and add your thoughts about the future of the forest.
- C. With limited land available in the National Forest, and increasing demand made on it, a major part of planning is how to most effectively utilize the land and minimize the conflicts. For instance, the conflict between wildlife habitat needs and people's use of the area has led to discussion of the future management of Cave Creek Canyon located in the Chiricahuas. With increasing energy costs, conflicts arise concerning demand for firewood gathering areas, versus the protection of the natural resources such as soils and vegetation in these areas. Please comment on these examples of uses/concerns/problems in the forest, and add others that come to mind.

- D. Comments are also welcome on the management of the forest in the examples mentioned as well as other situations that concern you.

Instrument 3:

A card distributed to individuals who attended the public forums which asked them to indicate how they found out about the forum (mailed invitation included with the response form described immediately above, friend, radio, organizational newsletter, television, newspaper story, newspaper advertisement, and/or poster) and how they would identify themselves (taxpayer, interested citizen, rancher, birdwatcher, Forest Service permittee, miner, environmentalist, government official, hunter, ORV enthusiast, Forest Service employee, and/or other; and Mexican-American, Black, or Anglo).

Instrument 4:

The following discussion topics which differ only slightly, but in some more important ways, from the topics list under #2 were discussed by participants at the twelve planning forums.

- A. Some of the major activities people participate in are hiking, picnicking, mining exploration, fuelwood gathering, camping and birdwatching. Obviously there are many more activities. What do you personally do in the forest? What activities/uses do you participate in? We need your opinion on the important uses of the forest such as wildlife, timber, grazing, watershed, recreation, and mining. What are the important uses?
- B. Over the years situations change and activities in and uses of a National Forest vary. Projections include larger populations with more leisure time. Picnicking and camping in motorized vehicles are expected to increase and fuelwood gathering will become more popular as energy costs go higher. Other activities and uses are changing as well. What will the forest be like in 20 years? If you could have your way, what would the forest be like? Describe the ideal situation. Please describe the situation as it will probably exist. What will really happen in the forest in the future?
- C. With limited land available in the National Forest, and increasing demand made on it, a major part of planning is how to most effectively utilize the land and minimize conflicts. For instance, the conflict between wildlife habitat needs and people's use of the area has led to discussion of the future management of Cave Creek Canyon located in the Chiricahuas. With increasing energy costs, conflicts arise concerning demand for firewood gathering areas versus the protection of the natural resources such as soils and vegetation in these areas. What are some of the major issues/concerns in the National Forest? on the local level? on the national level?
- D. Management decisions are important in how the forest operates. What compliments, complaints do you have on the management of the Coronado

National Forest? on a district of the forest? on the national level? What about the level of facilities that exist? are they adequate? are there some that you would like to see that don't exist or that are too few? too many? wrong kind? (facilities mean camping sites, drinkers)

- E. Any additional comments? points you want the Forest Service to consider in working on a land use plan?

Instrument 5:

Forum participants were asked to rank top Forest uses and Issues.

2. Directories and other sources included the following: mailing lists provided by Chambers of Commerce in Douglas-Bisbee, Willcox, Nogales, Saf-ford, and Tucson; several telephone directories, the Wildlife Foundation Directory; and mailing list of the Jewish Council, Southern Arizona Environmental Council, County Extension Services, Affirmitive Action, Federation of Homeowners Association, and Pima County Parks and Recreation Department.
3. Supra note 1, see instrument 1.
4. See later section on "Summary and Analysis of Discussions with District Rangers."

Glossary

| | |
|-------------------------|---|
| Commercial forest land: | Forest land producing or capable of producing crops of industrial wood. |
| Growing stock: | Live trees of commercial species meeting specified standards of quality or vigor. |
| Stocking: | Number of board feet of commercial quality timber/acre. |
| Roundwood products: | Logs, bolts, or other round sections cut from trees. In this report, includes sawlogs, fuelwood, poles, mine timbers, and other round products. |
| Timber production: | Production of roundwood timber products. |
| Acre foot: | 1 acre of water one foot in depth. |
| AUM: | The forage resource needed to support 1,000 lbs. of cattle for one month. |
| Visitor day: | 1 or more people using the site a total of 12 hours. |

REFERENCES CITED

- Ambrose, Steve, Coronado National Forest, Douglas District Ranger Office. 1978. Personal communications.
- Arizona Water Commission. 1977. Arizona state water plan: Phase III. Arizona Water Commission, Phoenix.
- Bisson, Henri R. and David A. King. 1974. Distance-use relationship for campgrounds in the Graham Mountains.
- Coronado National Forest. 1978. Forest land management plan--work plan. Coronado National Forest, Tucson, August 15.
- Ffolliott, Peter and David Thorud. 1975. Water yield improvement by vegetation management: Focus on Arizona. University of Arizona School of Renewable National Resources, Tucson.
- Greely, Mike, Field Engineer, Department of Mineral Resources. 1978. Personal communication.
- Gregory, Paul, Hydrologist, Coronado National Forest. 1978. Personal Communication.
- Keith, Stanton. 1973. Index of mining properties in Cochise County, Arizona, bulletin 187. University of Arizona, Tucson.
- _____. 1974. Index of mining properties in Pima County, Arizona, bulletin 189. University of Arizona, Tucson.
- _____. 1975. Index of mining properties in Santa Cruz County, Arizona, bulletin 191. University of Arizona, Tucson.
- _____. 1978. Copper production in Arizona, 1862-1977. Fieldnotes 8: (Spring-Summer).
- Kelso, Maurice M., W.E. Martin and L.E. Mack. 1973. Water supplies and economic growth in an arid environment: An Arizona case study. University of Arizona Press, Tucson.
- McAlister, Dean, Coronado National Forest, Catalina District Ranger Office. 1978. Personal communications.
- Rhea, Dick, Coronado National Forest, Safford District Ranger Office. 1978. Personal communication.
- Salyer, Doug, Coronado National Forest, Sierra Vista District Ranger Office. 1978. Personal communication.
- Setzer, Theodore S. and Terrance S. Throssell. 1977. Arizona timber production and mill residues, USDA Forest Service research note INT-230.

Shupe, Howard, Management Staff Officer, Coronado National Forest. 1978 Personal communication.

U.S. Forest Service. 1976. The national forest management act of 1976, current information report no. 16. USDA, Washington, D.C., December 1976.

_____. 1978. Draft regulations for national forest system land and resource management planning. Federal Register 43 (August 31): 39-046-39059.

Winn, Frederick. 1952. A box collection. Arizona Historical Society, Tucson.

Valley National Bank. 1977. Arizona statistical review, 33rd annual edition. Phoenix.

Van Driel, Don, Coronado National Forest, Nogales District Ranger Office. 1978. Personal communication.

III. A SOCIOECONOMIC AND POLITICAL OVERVIEW OF THE CNF HUMAN RESOURCE UNIT

INTRODUCTION

To even the most casual observer it must certainly be evident that southeastern Arizona is a fast growing, rapidly changing, and increasingly dynamic area. In the relatively brief span of years since the Second World War, the tremendous influx of people and industry to the area has irrevocably altered its character from that of a sparsely populated rural outpost based primarily upon the extractive industries of mining and agriculture, to a modernizing, urbanizing society with a diversified economy which has developed growing and deepening ties to regional and national social, economic, and political systems. This transformation, though not yet complete, has thus far been dramatic, and the likely prospect that it may only portend a near-term future of even more intensive development and greater change seems truly startling. The scale of such change presents a genuine possibility that without adequate foresight and planning, the institutional and natural resource capabilities of the region could be outstripped by the onrush of further development. At the very least, the area's capabilities to accommodate rapid change will be challenged. The purpose of this chapter is to focus on some of the basic components of this change.

The specific implications for the CNF of significant social, economic, and political change in the communities immediately surrounding the Forest are as uncertain as they are likely to be wide-ranging. In a general sense, however, the changing character of the region will most certainly be accompanied by changing levels and patterns of Forest use; i.e., significant alterations of the present demands for resources and opportunities afforded by the CNF land will occur. But how can these demands be foreseen and plans for meeting them developed? Methods for assessing demand, or at least for reducing the uncertainty of our knowledge about future demand, might include such things as market price, extensive in-depth surveys, or even government fiat. Such methods are not, nor are they likely to be, available to the CNF. Consequently, less direct and less precise methods must necessarily be employed.

Purpose of this Overview

The overview of southeastern Arizona presented here constitutes only a very basic informational component necessary for beginning to understand the local society whence demands on the Forest emanate. Its purpose is to provide the CNF with only a very general look at the socioeconomic-political environment with which the CNF most immediately and directly interacts. Ideally, the most detailed information of this sort would clarify all of the important characteristics of all of the people who presently and potentially

impact the Forest land and/or are affected by CNF land management policies and practices. Such complete information could, theoretically, reduce to some extent the uncertainty faced by land managers in ascertaining the present and future demand on the Forest from the surrounding community.

This document does not pretend to attain the ideal. The intention here is much different and much more modest; it is to provide a background document, rather than a specific decision-making tool, which will contribute to a general understanding of the context within which Forest land management planning is pursued and decisions are made. More specifically, what is provided in this chapter is some rudimentary, and often rather raw, information about some of the fundamental socioeconomic and political features characteristic of southeastern Arizona, including: some basic demographic and social characteristics of the population; employment and income patterns; and features of the political and institutional framework governing the area. It is hoped this information can give the reader a brief glimpse at some basic characteristics of the population and community which may have a part in influencing levels and patterns of demands on the CNF. The actual levels and patterns are not extensively discussed; rather these are left, for the most part, to the "Issue Scenarios" chapter and to the readers' knowledge and imagination.

Expected Utility of the Overview

If this overview is not intended to be used as a specific decision-making tool for Forest land managers, what then is its expected usefulness? What is the relationship between the type of information presented here and the assessment of demands on the CNF? Beyond its intended use as an introductory background document, its expected utility is essentially two-fold. First, it is to indicate the most elementary variables to monitor not only on a Forest-wide level but also on the level of a specific case in a given district (or districts), and to thereby provide a Forest-wide context against which to compare the specific characteristics of local areas relevant to any particular case. Second, when used as one component in conjunction with other products of the UA Project Team (which comprise the other chapters of this report), namely, the "Resource Overview," the "Issue Scenarios," and the "Utilization Methodology," and with the practical knowledge and experience of CNF land managers and personnel, the overview will hopefully assist in catalyzing a greater sensitivity to important social, economic, and political realities of the local community with which the CNF most directly interacts. In addition, it should be pointed out that whatever the reader might find useful here can be relatively easily expanded and updated for most, if not all, particular applications.

Data Sources

The preparation of this report has relied exclusively on easily accessible published sources which are periodically updated. It is suggested

that the items listed below be consulted first if a more detailed research effort is undertaken or if updating of the present material is desired.

U.S. Department of Commerce, Bureau of the Census

Census of Population, General Population Characteristics of Arizona. 1970, 1960, 1950, 1940. A standard source for historic quantitative data on social and economic characteristics of the population. Much of the data is presented on a county basis. Given the fact that the census is conducted only once every ten years, the contemporary value of the data rapidly diminishes.

City and County Data Books. Published in 1947, 1949, 1952, 1956, 1962, 1967, 1972, and 1977; these publications provide a summary of quantitative census data for all states and counties, and several communities in the United States. The volumes are a convenient source of general census data, but the method of compilation makes comparisons over time difficult without consulting other sources.

County Business Patterns. These volumes have been published annually since 1964, and were published irregularly prior to that date. The volumes are a standard source for payroll and employment statistics by county and by industry.

U.S. Department of Commerce, Bureau of Economic Analysis

Local Area Personal Income 1970-1975, vol. 7: Southwest Region, August 1977. Presents estimates of personal income by type of payment and of labor and proprietors' income by major industry.

Arizona Office of Economic Planning and Development

Arizona Community Profiles. Looseleaf. This volume contains two-page up-to-date summary information on the principal economic activities, population, labor force, taxes, government services, community facilities, and other topics for several Arizona communities.

Information References, Social and Economic Planning. Looseleaf, August 1977. This volume provides a general description of the socioeconomic data on Arizona available from sixty-three state and federal agencies in the state. The data described are largely generated at regular monthly or yearly intervals. Both published and unpublished data, but only reasonably accessible data, are described. A subject index indicating information that may be available from a variety of agencies is included.

Information References: Land and Natural Resource Planning. Looseleaf, September 1976. This manual is intended as a guide for planners, officials, and researchers and provides summaries of state and federal agencies in Arizona and the data which they provide.

Baseline Scenario and Projections for the Arizona Economic and Demographic Projection Model, July 26, 1977. A collection of tables showing annual projections of population, employment, income, and other variables for all Arizona counties.

Division of Economic and Business Research, University of Arizona

Statistical Abstract of Arizona, 1976. Nat de Gennaro (ed.). This convenient volume contains a plethora of basic quantitative socioeconomic and other data collected from a variety of sources and presented in over 500 tables and maps. Much of the data permits historical comparisons among cities and counties in the state, as well as between Arizona and other southwestern states and the nation. Future editions are planned.

Arizona Review. This magazine is published monthly, except during July and August. It provides a regular review of Arizona's economy, statistical tables, and feature articles on major industries and economic and social issues such as energy, water, and health.

The Economic Impact of Mexican Visitors to Arizona. Nat de Gennaro and Robert J. Ritchey, September 1978.

DEFINITION OF THE STUDY AREA

The Human Resource Unit (HRU)

The definition of the study area for the purpose of this report has in many ways been guided by, if not entirely faithful to, criteria suggested by SEAM's concept of a Human Resource Unit (HRU). The HRU concept is intended as a heuristic device for conceptualizing the groups, agencies, industries, and the public at large which form a community potentially affected by significant changes in land management and use. The community comprising an HRU is more specifically defined, on the one hand, in terms of geographic proximity to Forest land, and on the other hand, by "the lines and limits of social, economic, and political influence". In other words, the concept suggests, definition of the community should maintain a strong local focus and be defined narrowly enough to maintain an almost parochial unity, and yet should be comprehensive enough to encompass a community that is viable as an economic unit and possesses adequate authority to bring about land use changes and control, and to solve issues.

The Floating Boundaries of the CNF HRU

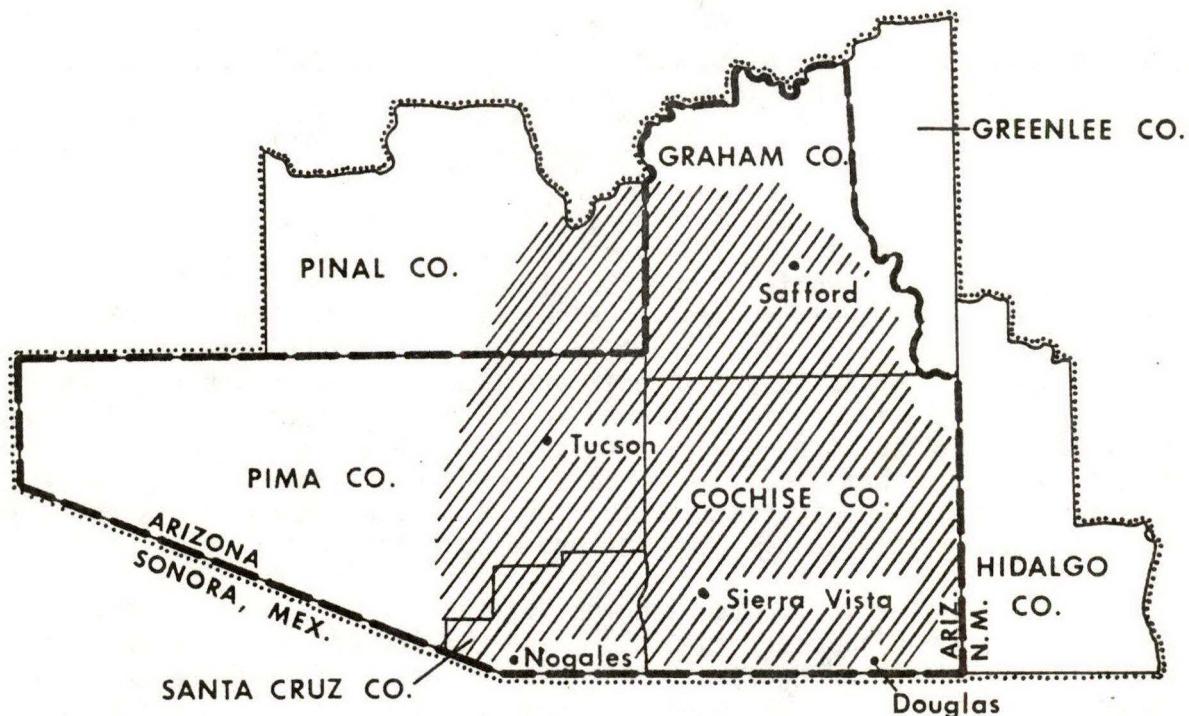
Built into the concept then is a tension that defies a precise setting of geographic boundaries around an HRU. This tension leads to the recognition that the social, economic, and political composition and fabric of a community which form an HRU are not constants, but will necessarily change

with any given issue. Given the fact that the CNF is geographically fragmented and exhibits a multi-issue character, the definition of an HRU for the purposes of Forest-wide planning should insist on flexible boundaries. In keeping with the need for "floating boundaries", three definitions of the CNF's HRU are employed in this chapter. These are illustrated by the map in Figure III-1. The two principal boundaries employed in this paper, due to the nature of published data, coincide with county lines. First, for the purpose of describing general demographic and social characteristics of the population, an HRU encompassing the seven counties of Pinal, Pima, Santa Cruz, Cochise, Graham, Greenlee in Arizona and Hidalgo in New Mexico was formulated. With the exception of Greenlee County, which is included because of its proximity and otherwise close ties to Graham County, these counties are included because some portion of CNF land occurs within them. In some cases, Hidalgo is not included because of data deficiencies.

For purposes of describing general economic characteristics of the HRU, data were gathered on a four-county basis, which includes Pima, Santa Cruz, Cochise, and Graham counties. Peripheral counties of Hidalgo and Pinal were excluded because of their strongly agricultural economic bases which have little direct connection with Forest land. Pinal's economy is, for the most part, tied more closely to the Phoenix area than to the Tucson area, and the bulk of its population, which is found in the northern portion of the county, is probably oriented more towards forests other than the Coronado. Furthermore, it was felt that Hidalgo and Greenlee could be excluded because of their very minor economic contribution to the HRU, and therefore such exclusion would not significantly bias the overall picture.

Third, and finally, in the judgment of the authors (based on their understanding of the HRU concept, intuition, and the iterative process of examining and analyzing published data), if the ease and practical considerations of data gathering on an HRU-wide basis are ignored, the most exclusive definition of the CNF's HRU would be approximately bounded to the south at just the other side of the international border so as to include the border towns in Sonora; to the east, from southeast to northeast, by the eastern reaches of the San Bernadino Valley and the San Simon Valley; to the north, by the Gila River; to the northwest, by a line running from the Tortilla Mountains through Picacho Peak to the Silver Bell Mountains; and to the west by the eastern boundary of the Papago Indian Reservation. Defined in this manner, what might be termed the "core HRU", a detailed description of the HRU, could proceed on community and issue specific bases. High priority communities include: the Tucson urban area; Nogales, Arizona and Sonora; Sierra Vista-Ft. Huachuca; the Douglas-Aqua Prieta urban area; and the Safford-Thatcher-Pima communities. The choice of which HRU boundary to adopt or which communities to investigate in more detail must be determined by whatever is the issue at hand.

Conspicuously absent for the core HRU are the area's Indian Reservations. The most important relationships between the two principal reservations, the San Carlos Apache and the Papago Indian Reservation, and the wider study area are, to a great extent, mediated by the federal government. It is most often through this indirect route that significant lines of social, economic, and political influence run. This is not to deny that there are some strong



- HRU Boundary for Summary of HRU Social and Demographic Characteristics.
- HRU Boundary for Summary of HRU Economic Characteristics.
- County Boundaries.
- / / / / / "Core HRU"

Figure III-1: Coronado National Forest HRU.

localized lines of influence which connect the reservations directly to the off-reservation community; but those which are thus far established with the study area are relatively insignificant. The principal area of off-reservation employment is in Gila County's copper mining industry to the north of the study area. The potential for significant near-term importance of the reservations for the study area is limited by the fact that in 1970, the Indian population of the entire seven-county area was only about 3.2% of the total population. Furthermore, state of Arizona projections show this percentage will hold at its present level through 2000. Finally the highest rates of population growth among Indians are foreseen to occur among Indians whose off-reservation ties are principally outside of the study area. These indicators, however, may belie the very important potential impact the reservations may have on the HRU if Papago Indian claims to water rights are successful.

Identification of Important Variables

Once the study area is defined in terms of the floating boundaries just described, further definition of the HRU is required concerning the important variables for which information should be gathered. The HRU concept is of little help as a theoretical tool for positing causal or other relationships between CNF management practices and community characteristics. The concept was designed principally with issues involving mining development in mind, particularly coal mining, for which past experience provides well-known evidence about key variables which ought to be monitored. Consequently, the concept is deficient as a theoretical underpinning for the more difficult task of selecting the most important variables relevant to a multi-issue comprehensive planning process such as undertaken by the CNF. Without a strong theoretical rationale or an issue-specific context the variables were selected on the basis of their fundamental importance to planning for almost any purpose. To venture any further, it was felt, would involve an atheoretical "fishing expedition" of dubious value.

A BASIC DESCRIPTION OF THE CORONADO NATIONAL FOREST'S HUMAN RESOURCE UNIT

The Land and Its Administration

The Coronado National Forest's HRU (defined as the seven-county area discussed above) encompasses a land area of approximately 20.5 million acres. As shown in Table III-1 19.8% of the land is Indian Reservation land (and includes all of the Papago and San Xavier Reservation at the northern range of the HRU); 34.1% is federal land; 22.9% is state land; and 23.2% is under private ownership. The highest concentration of Indian Reservation land is found in Pima County (41.9% of the county land area).

Within the six Arizona counties (which make up 89% of the total land area of the HRU) the administration of non-Reservation land is divided among

Table III-1: HRU Land Status
(Acres in Thousands)

| <u>County</u> | <u>Total County Acreage</u> | <u>Federal Land</u> | | <u>State Land</u> | | <u>Private Land</u> | | <u>Indian Land</u> | |
|-------------------------|-----------------------------|---------------------|----------|-------------------|----------|---------------------|----------|--------------------|----------|
| | | <u>Acres</u> | <u>%</u> | <u>Acres</u> | <u>%</u> | <u>Acres</u> | <u>%</u> | <u>Acres</u> | <u>%</u> |
| Cochise | 4004 | 959 | 24.0 | 1363 | 34.0 | 1682 | 42.0 | 0 | 0 |
| Graham | 2950 | 1215 | 41.2 | 504 | 17.1 | 240 | 8.1 | 991 | 33.6 |
| Greenlee | 1199 | 988 | 82.4 | 143 | 11.9 | 68 | 5.7 | 0 | 0 |
| Pima | 5914 | 1806 | 30.5 | 921 | 15.6 | 707 | 12.0 | 2480 | 41.9 |
| Pinal | 3442 | 700 | 20.3 | 1354 | 39.3 | 789 | 22.9 | 599 | 17.4 |
| Santa Cruz | 797 | 436 | 54.7 | 62 | 7.8 | 299 | 37.5 | 0 | 0 |
| Hidalgo | 2206 | 883 | 40.0 | 360 | 16.3 | 964 | 43.7 | 0 | 0 |
| Totals | 20512 | 6987 | 34.1 | 4707 | 22.9 | 4749 | 23.2 | 4070 | 19.8 |
| Totals for Az. Counties | 18306 | 6104 | 33.3 | 4347 | 23.7 | 3785 | 20.7 | 4070 | 22.2 |

Source: U.S. Department of Agriculture, Arizona Crop and Livestock Reporting Service,
1974 Arizona Agricultural Statistics.

the State (30.4%), the Forest Service (19.3%), and the Bureau of Land Management (BLM) (15.2%). Private individuals and corporations own about 28% of the non-Reservation land in the Arizona counties. The Coronado National Forest is responsible for administering about 51% of the Forest Service Land in the six counties, or approximately 9.6% of the non-Indian land. The remaining 7.1% of non-Indian land includes land administered by the National Park Service, the Department of Defence, the Bureau of Sport Fisheries and Wildlife and the Bureau of Reclamation and various other public agencies.

The distribution of these jurisdictions finds the Forest Service with primary responsibility for administering the largest of the several dispersed mountain ranges which dominate the landscape. Responsibility for managing four smaller mountain ranges in the area rests primarily with BLM, although the state and private owners have significant shares of land in these mountains. The land immediately surrounding the national forest lands is a nearly even mixture of state trust lands and privately-owned land.

In the lowlands and principal river valleys (the Sulphur Springs, San Pedro, and Santa Cruz valleys) private ownership predominates, with the exception of the San Simon Valley along the northeastern edge of the study area which is mainly BLM land. Two smaller valleys in the study area, the San Bernardino Valley in the southeastern portion, and the San Rafael Valley to the south, are under state and private control respectively. The portion of the Gila River Valley running through the northern area of the HRU is nearly equally divided between private ownership of the eastern section of the valley and San Carlos Indian ownership of the western portion.

It is in the Sulphur Springs, San Pedro, Santa Cruz and San Simon river valleys (which run in a north-south direction and are roughly separated by mountain ranges under the administration of the CNF) where the concentrations of people are found, where the principal social, economic, and political activities in the study area take place, and where most local demands on the CNF originate. The significance of these populations increases as one moves from east to west across the study area.

Population

The feature of the study area population with the most importance for the management of the CNF is the rapid and continuing increase of people in the area. It is this rapid population growth which has the single greatest importance for determining the character of the area's social, economic, and political activity. The population of the study area in 1975 stood at 658,248 (the 1977 population has been estimated at 673,200), representing a 157% increase since 1950. During just the first half of the present decade the population has increased by 24.7%. Projections for the Arizona portion of the HRU indicate further population increases of 15.4% from 1975-1980 and of 25.8% and 15.6%, respectively, for the decades ending in 1990 and 2000. Historic and projected population figures for HRU counties are displayed in Tables III-2 and III-3.

Table III-2: Population of HRU Counties, 1960-1977

| | 1960 | | | 1970 | | | 1977 | | |
|------------|----------------------------|---------------------------------|------------------------------|----------------------------|---------------------------------|------------------------------|----------------------------|---------------------------------|------------------------------|
| County | Total Pop. and % of HRU | Avg. Annual % Change 1950-60 | due to net tot. migration | Total Pop. and % of HRU | Avg. Annual % Change 1960-70 | due to net tot. migration | Total Pop. and % of HRU | Avg. Annual % Change 1970-77 | due to net tot. migration |
| Cochise | 55,039 (13.0) | 7.5 | 4.9 | 61,918 (11.7) | 1.3 | -0.6 | 75,400 (11.2) | 3.1 | 1.5 |
| Graham | 14,045 (3.3) | 0.8 | -1.7 | 16,578 (3.1) | 1.8 | 0.2 | 20,200 (3.0) | 3.1 | 1.6 |
| Greenlee | 11,509 (2.7) | -1.0 | -3.7 | 10,330 (2.0) | -1.0 | -2.3 | 11,000 (1.6) | 0.9 | -1.1 |
| Pima | 265,660 (62.6) | 8.8 | 5.7 | 351,667 (66.6) | 3.2 | 1.8 | 454,600 (67.5) | 4.2 | 3.1 |
| Pinal | 62,673 (14.8) | 4.5 | 1.0 | 68,579 (13.0) | 9.4 | -8.1 | 88,300 (13.1) | 4.1 | 2.5 |
| Santa Cruz | 10,808 (2.5) | 1.6 | -1.0 | 13,966 (2.7) | 2.9 | 0.7 | 17,900 (2.7) | 4.0 | 2.2 |
| Hidalgo | 4,961 (1.2) | -0.3 | -2.6 | 4,734 (0.9) | -0.5 | -2.2 | 5,800* (0.9) | 3.2 | ? |
| Totals | 424,695 (100) | 6.6 | 5.0# | 527,772 (100) | 2.4 | 0.8# | 673,200 (100) | 3.9 | 2.6# |

* 1975 estimate.

calculated based on both immigration to HRU and migration from county to county within the HRU, and figure is therefore inflated as an HRU total.

Table III-3: Projected Population for
HRU (Arizona Counties Only), 1978-2000

| | 1978 | 1980 | 1990 | 2000 | | | | |
|---------------|---------------------------------------|--|---------------------------------------|--|---------------------------------------|--|---------------------------------------|--|
| <u>County</u> | <u>Tot. Pop. and % of HRU</u> | <u>Avg. Ann. % change, 1970-78</u> | <u>Tot. Pop. and % of HRU</u> | <u>Avg. Ann. % change, 1970-80</u> | <u>Tot. Pop. and % of HRU</u> | <u>Avg. Ann. % change, 1980-90</u> | <u>Tot. Pop. and % of HRU</u> | <u>Avg. Ann. % change, 1990-2000</u> |
| Cochise | 79,500 (11.4) | 3.6 | 91,300 (12.3) | 4.8 | 116,200 (12.8) | 2.7 | 134,800 (12.4) | 1.6 |
| Graham | 22,200 (3.2) | 4.2 | 24,700 (3.3) | 4.9 | 32,700 (3.6) | 3.2 | 36,200 (3.3) | 1.1 |
| Greenlee | 11,200 (1.6) | 1.1 | 11,400 (1.5) | 1.0 | 13,700 (1.5) | 2.0 | 14,500 (1.3) | 0.6 |
| Pima | 474,100 (68.1) | 4.4 | 498,800 (67.3) | 4.2 | 608,900 (67.1) | 2.2 | 744,800 (68.3) | 2.2 |
| Pinal | 89,900 (12.9) | 3.9 | 95,900 (12.9) | 4.0 | 109,200 (12.0) | 1.4 | 127,500 (11.7) | 1.7 |
| Santa Cruz | 18,800 (2.7) | 4.3 | 19,600 (2.6) | 4.0 | 26,300 (2.9) | 3.4 | 32,100 (2.9) | 2.2 |
| Totals | 695,700 | 3.2 | 741,700 | 4.1 | 907,000 | 2.2 | 1,089,900 | 2.0 |

Sources: Arizona Office of Economic Planning and Development, Baseline Scenario and Projections for the Arizona Economic and Demographic Projection Model. 1970 figures used in calculations were from Bureau of the Census, Census of Population, General Population Characteristics of Arizona, 1970.

A corollary to this rapid increase in population has been a rapid transformation of the area's population from a rural to an urban setting. In 1950, the population was nearly equally balanced between urban and rural residents, and the population density stood at about eight persons per square mile. For the decade ending in 1960 the urban-rural balance shifted markedly as the percentage of urban residents jumped from 50.6% in 1950 to 72.2% and the density of the HRU increased to 13.3 persons per square mile. During the 1950's and 1960's population decreases occurred in the rural counties of Hidalgo and Greenlee. The rush toward urbanization in the 1950's slowed during the 1960's, and by 1970 75% of the population was classified as urban. The density of the population more than doubled from 1950-1970, standing at 16.5 persons per square mile in 1970. This further concentration of the population has continued into the present decade, and in 1977 the density had increased to 21 persons per square mile. Population levels and density increase as one moves from east to west across the study area.

The most important concentration of population is in Pima County, where more than two-thirds (68.3%) of the study area population was located in 1975. Nearly two-thirds of Pima County's population is concentrated in the city of Tucson and over 90% is concentrated in the greater Tucson urban area. In 1950 the population of Tucson was 45,454, or about 18% of the population of the entire HRU. By 1977 the population of Tucson had grown to approximately 307,000, 45.8% of the study area's population within the city limits. Tucson's 1977 population represented a 17.1% increase over the 1970 level. A recent projection by the Tucson Planning Department foresees a population for the city of 319,800 and of 463,400 for the Tucson urban area by 1979.

For the Arizona counties over two-thirds of the population increase from 1970 to 1977 was due to in-migration, and more than three-fourths of these new residents settled in Pima County, almost exclusively in the Tucson urban area. For the period 1960-1970, only slightly more than one-third of the increase in population was due to in-migration.

Among existing households in Tucson in 1977, less than half (46%) had been in the city more than five years, and 25% had been established in Tucson for less than one year. In 1977, the most important reason for households moving to Tucson was for employment (35%), followed by climate (18%), health (16%), education (12%), relatives (5%), and retirement (4%). In 1977, only 16% of Tucson households could claim Arizona as their native state. An equal proportion (16%) of households came to Tucson from the combined surrounding states of California, Nevada, New Mexico, and Colorado; and another 16% came from either Ohio, Michigan, or Illinois. Slightly fewer households (15%) arrived from New York, New Jersey, or Pennsylvania. The midland states of South Dakota, Kansas, Missouri, Texas, and Arkansas were the previous states of residence for 14% of the Tucson households. Seven percent of Tucson area households came to the area from outside of the United States, most notably from Mexico.

The Tucson area is clearly the dominant population center in the study area and in many respects, it is safe to assert, as Tucson goes, socially, economically, and politically, so goes the HRU. Though less significant than Tucson, there are four additional, lesser urbanized areas with relatively

close proximity to CNF land. Each of the areas has present populations in excess of 10,000 and is projected to undergo significant population increases in the next 20 years. Table III-4 displays the populations and growth rates of these and other selected communities in the HRU.

Joining Tucson in the Santa Cruz River basin are the urban areas of Nogales, Sonora, and Nogales, Arizona. The population of Nogales, Sonora is very difficult to determine precisely, but recent estimates placing it at well over 100,000, perhaps as high as 140,000, have been made. The 1977 population of Nogales, Arizona stood at approximately 11,294. It has been projected that the population of Nogales, Arizona will increase 68.1% by 2000 to a total of about 18,987.

Moving eastward to the San Pedro Valley, a third significant urbanized area has been rapidly developing in the Sierra Vista-Ft. Huachuca area, located in the south-central portion of the study area. The vitality of the area is intimately related to the growing significance of the U.S. Army's Ft. Huachuca. The population level has risen dramatically in only the last seven years, growing from 18,557 in 1970 to approximately 26,305 in 1977, a seven year increase of 41.8%. The projected population for the area in 2000 has been estimated at 62,214, representing a possible 136.5% increase over the 23-year period.

Moving eastward to the Sulphur Springs Valley, a fourth significant population center is located in the Douglas urban area. For the ten-year period from 1960 to 1970 the population of the city of Douglas grew by only 4.5%, and from 1970 to 1977 increased by only 2.3% within the city limits. In 1975 the population of the total Douglas area stood at an estimated 15,500. For the twenty-five year period ending in 2000, the total population growth for Douglas has been projected to be approximately 70.3%.

As one moves further east, into the San Simon Valley, a final urbanized area is found in the northeastern sector of the study area which includes the towns of Safford, Thatcher, and Pima. In 1970 the population was approximately 8837, growing to 11,140 in 1977, an increase of about 26.1 for the seven-year period. A projection for the population level of the area in 2000 has been estimated at 29,606, an increase of 165.8% for the twenty-three year period.

Some Social Characteristics of the Population

Differences between urban and rural dwellers within the HRU extend beyond mere population levels, densities, and migration rates. As one moves from the most rural to the most urban areas of the HRU, differences in age, racial composition, educational attainment, and income can be perceived. Generally, as one moves from east to west across the HRU a higher median age, more years of schooling, a relatively larger white population, and higher personal incomes are encountered.

Table III-4: Population and Average Annual Percent Growth Rate, Selected HRU Communities, 1960-1977

| <u>Communities</u> | <u>1960</u> | <u>1970</u> | <u>1977</u> | <u>Avg. Ann. % change, '60-'70</u> | <u>Avg. Ann. % change, '70-'77</u> |
|--------------------------------|-------------|--------------------------------|--------------------------|------------------------------------|------------------------------------|
| Tucson | 212,892 | 262,933 (Santa Cruz Valley) | 307,000 | 2.4 | 2.1 |
| Nogales | 7,286 | 8,946 | 11,254 | 2.3 | 3.7 |
| Eloy | | 5,381 | 6,945 | | 4.1 |
| South Tucson | | 6,220 | 6,275 | | 0.1 |
| Green Valley | | 2,998 | 5,000 | | 9.5 |
| Tubac | | -- | 600 | | -- |
| Patagonia | | 630 | 900 | | 6.1 |
| Picacho | | -- | 667 | | -- |
| | | | (San Pedro Valley) | | |
| Sierra Vista/ Huachuca City | 4,451 | 18,565 | 26,075 | 31.7 | 5.8 |
| Bisbee | | 8,329 | 9,800 | | 2.5 |
| San Manuel | | 4,332 | 4,550 | | 0.8 |
| Benson | | 2,839 | 3,960 | | 5.6 |
| Mammoth | | 2,042 | 2,325 | | 2.0 |
| Oracle | | -- | 2,000 | | -- |
| Tombstone | | 1,241 | 1,800 | | 7.5 |
| Hayden | | 1,283 | 1,625 | | 3.8 |
| Winkelman | | 974 | 1,000 | | 0.04 |
| | | | (Sulphur Springs Valley) | | |
| Douglas | 11,925 | 12,462 | 12,750 | 0.45 | 0.33 |
| Willcox | | 2,568 | 3,105 | | 3.0 |
| | | | (San Simon/Gila Valley) | | |
| Safford/Thatcher/ Pima | 7,035 | 8,837 | 11,025 | 2.6 | 3.5 |
| Bowie | | 489 | 600 | | 3.3 |
| San Simon | | | | | |
| Duncan | | 773 | 1,025 | | 4.7 |

Source: Arizona Office of Economic Planning and Development, Arizona Community Profiles.

In the most rural counties of the HRU (Pinal, Hidalgo, and Greenlee) the population is characterized by a rather high proportion of very young people and a low proportion of elderly people relative to the more urbanized Pima County. This is chiefly the result of higher fertility rates and out-migration in these counties. Age differences among the counties in the HRU are also reflected in the median age, which in 1970 fell below the state median age (26.3) in all but Pima County (where the median age was 27.2). In 1970, the median age in all counties in the HRU was below the median age of 28.1 years for the United States as a whole.

The educational attainment of the adult population also demonstrates strong differences among the counties within the HRU. The median school years completed by both sexes over 25 years old exceeded or equaled that for the United States (12.1) in only Pima (12.4 years for both men and women) and Cochise counties (12.1 years for women and 12.2 years for men). Also, only in Cochise and Pima counties were more than half of both adult men and women high school graduates (57.1% of men and 54.7% of women in Cochise County, and 63.6% of the men and 62.6% of the women in Pima County). In contrast, the lowest educational attainment was found in the predominantly agricultural counties of Pinal and Hidalgo. In Hidalgo County the median school years completed was 10.2 for men and 10.8 for women and only 37.1% of adult males and 40.7% of adult females were high school graduates.

Distinct differences in racial composition can also be found among the HRU counties. Estimates for 1977 by the Arizona Department of Economic Security indicate that among the six Arizona counties in the HRU, Greenlee and Pinal exhibit the greatest racial heterogeneity, with Pima and Santa Cruz showing the lowest level of diversity in their racial composition. The estimated racial distribution in 1977 for the Arizona counties and the State of Arizona are shown in the following table:

Table III-5. Racial distribution for Arizona counties.

| <u>County</u> | <u>White</u> | <u>Hispanic</u> | <u>Indian</u> | <u>Black</u> | <u>Other</u> |
|---------------|--------------|-----------------|---------------|--------------|--------------|
| Cochise | 62.6% | 33.3% | .3% | 2.9% | .9% |
| Graham | 63.9% | 23.9% | 8.8% | 2.0% | 1.5% |
| Greenlee | 48.2% | 50.0% | .9% | 0% | .9% |
| Pima | 69.4% | 23.7% | 3.0% | 2.9% | 1.0% |
| Pinal | 48.7% | 36.7% | 9.4% | 4.5% | .8% |
| Santa Cruz | 21.4% | 77.5% | 0% | .5% | .5% |
| Arizona | 72.0% | 18.7% | 5.6% | 3.0% | .7% |

Finally, income levels are also strongly correlated with the urban or rural character of the counties. The following table gives some indication of the relative standards of living among the counties of the HRU.

Table III-6: Income levels for Arizona counties.

| <u>County</u> | <u>1974 per capita income</u> | <u>1969 median family income</u> | <u>% families with income below poverty level, 1969</u> | <u>% families with income of \$15,000 or more, 1969</u> |
|---------------|---------------------------------------|--------------------------------------|---|---|
| Cochise | \$3,871 | \$ 8,333 | 13.4% | 14.7% |
| Graham | 3,250 | 7,261 | 19.3% | 8.5% |
| Greenlee | 4,403 | 10,044 | 8.1% | 12.1% |
| Pima | 4,643 | 8,942 | 10.8% | 18.2% |
| Pinal | 3,431 | 7,935 | 17.6% | 11.6% |
| Santa Cruz | 3,638 | 7,948 | 20.0% | 17.1% |
| Hidalgo | 3,119 | 7,404 | 22.1% | 9.4% |

The EconomyIntroduction

The recent economic development of the Coronado National Forest's HRU has, in many general respects, been typical of the post-World War II emergence of the "southern tier" or the so-called Sunbelt states as prominent contributors to national production. While the HRU's major metropolitan area, Tucson, has not achieved the national importance of other southwestern cities such as Houston, Los Angeles, Denver, or Phoenix, many of the same phenomena affecting other Sunbelt communities have touched Tucson and the HRU. Among these have been a large in-migration of people (especially from the north central and northeastern areas of the country), many of whom have sought employment and other opportunities presented by massive private and public investment in the aerospace, electronics, and computer industries; the construction of major highway and airway transportation systems linking formerly isolated areas to the rest of the country; the demise of small-scale farming and the rise of corporate agriculture; the increased importance of the service sector as a major employer and contributor to the base economy; and extensive new housing and building construction.

These trends have brought a greater diversity to the HRU's economy than previously existed, but the rather slow development of manufacturing industries has left the HRU with a relatively undiversified economy, precariously dependent upon the relatively unstable activities of copper mining, tourism, government expenditures, and agriculture. The recently announced move of a major IBM office to Tucson is expected to provide a major catalyst needed to rectify this situation.

In this section some employment and income characteristics of the major economic sectors are briefly surveyed, noting some historic trends and prognostications. As noted above, the four county (Cochise, Graham, Pima, and Santa Cruz) definition of the HRU is employed in this section.

Major Economic Activities of the HRU

The principal economic activities sustaining the HRU are copper mining, tourism and travel, federal government expenditures, and agricultural and livestock production. Relatively substantial contributions have also come from manufacturing, but, as just mentioned above, this sector has been slow in developing. In 1977, the impact of the primary non-governmental (or "basic") industries of mining, tourism, agriculture, and manufacturing totaled \$1,478,916,800 for the HRU (a figure representing about 30.2% of the total income to the state from these sources). Nearly half of these dollars (49.5%) represented the impact of tourism and travel expenditures, 29.8% came from mineral production, 10.8% from the value added in manufacturing, 6.1% from crop production, and 3.7% from livestock production. An additional \$1.27 billion in federal government expenditures were added to the HRU's economy in 1977, 79% of which flowed to Pima County, and 16.4% to Cochise County (where 70.5% of the federal dollars, \$147,058,022, represented the impact of the U.S. Army's Fort Huachuca).

The major share of all productive activity in the HRU is centered in the western portion of the HRU, primarily in eastern Pima County and the Tucson urban area. In 1977, Pima County contributed 97.3% of the value added in manufacturing for the HRU, 89.9% of the tourist and travel expenditures, and 85.7% of the value of mineral (primarily copper) production. The east central portion of the HRU (northern Cochise and Graham counties) is the principal area of agricultural and livestock production, contributing more than two-thirds (67.7%) of the value of HRU crop production and 61.7% of the value of livestock production.

These principal basic industries have spawned significant secondary (or "non-basic") industries in the construction, services, and trade sectors which are highly dependent on the performance of the basic industries. Because of the importance of tourist and travel expenditures, the trade and services sectors realize a substantial proportion of their receipts from sources outside of the HRU and therefore must, to some extent, be regarded as basic industries. In 1972, retail sales totaled about \$1.2 billion for the four-county area, about 82.2% of which was accounted for by Pima County. Total wholesale receipts for that year were about \$773 million, 77.3% of which was contributed by Pima County. The service sector showed receipts of about \$243.5 million in 1972, of which about 87.5% were generated in Pima County.

The CNF HRU is a significant contributor to the state's economy, second only to Maricopa County and the Phoenix urban area. Copper production in the HRU accounts for about one-half of the value of mineral production for the entire state. Most of the other half is produced in Greenlee County and southeastern Pinal County from mines immediately adjacent to the four-county HRU. About 25% of all tourist dollars to Arizona come from the four-county area, 16% of the state value of livestock production, and nearly 10% of the value added in manufacturing.

Employment

Historically, employment opportunities in the HRU have increased at a rate greater than the growth of the population. From 1950 to 1970 total employment in the four-county area increased 146.7% (about 86,400 jobs), while population increased 127.7% over the same twenty-year period. From 1970 to 1977 employment has increased 32.5%, while the population increased 27.9%. The average annual rates of increase for HRU employment and population from 1950 to 1970 were 7.3% and 6.4% respectively. From 1970-1977 the average annual rates of increase were about 4.6% for employment and slightly less than 4% for the population. Projections by the state of Arizona forecast an average annual rate of growth in employment of 3.4% between 1977 and 2000, and an average annual population increase of 2.9% for the same period.

In the basic industries of agriculture, manufacturing, and mining, an increase in total employment of 14,532 jobs was realized between 1950-1970, but less than one-fourth (3,482) of these jobs was gained between 1960 and 1970. During the decade ending in 1970 employment in these basic sectors increased 15.6%, well below the rate of increase for all employment, but well above the national increase of .7%. Mining registered an employment increase of 71.1% from 1960-1970 while manufacturing employment increased only 3.6% and agricultural employment declined by 16.9% for the same period.

The four-county area approximating the CNF's HRU has historically relied upon the service, trade, and government (especially the military) sectors as the major sources of employment. Excluding the government sector, these essentially non-basic sectors of trade and services are highly dependent upon and very sensitive to the activities in the basic industries of mining, manufacturing, tourism, and agriculture. In 1950 more than one in every three workers (35.4%) was employed in these principal non-basic support sectors. By 1970, the proportion of workers in these sectors decreased only slightly to 34.5% (16.3% retail trade, 2.9% wholesale trade, and 15.3% services). Between 1960 and 1970 employment in these sectors increased by 48.1%, well ahead of the 32% increase for all employment. During the 1970's employment in the HRU's service and trade sectors has continued to grow at a more rapid rate (37.6%) than has total employment (32.5%), and has remained as the dominant source of employment, accounting for more than one-third (33.7%) of all employees in 1977.

Employment in the basic industries of mining, manufacturing, and agriculture has increased only 3.2% over the same period, and in 1977 employed only 12.5% of the labor force. As different from the 1960's, during the first seven years of the present decade, employment has declined 11.6% in agriculture and 5.9% in mining, while increases have been realized in manufacturing (18.3%). In 1977 agricultural employment accounted for only 1.7% of all employment, down from 2.6% in 1970, 4.1% in 1960, and 7.9% in 1950. The percentage of the labor force employed in manufacturing stood at 6.7% in 1977, 8.3% in 1970, 10.4% in 1960, and 5.3% in 1950. The percentage of the work force employed in mining was 4.1% in 1977, 6.2% in 1970, 4.7% in 1960, and 4.5% in 1950.

Employment projections to 2000 foresee a 78% increase in total employment for the twenty-three year period. Among the basic industries, only manufacturing employment is expected to increase at a rate greater than total employment (104.9%). Mining employment is expected to increase by only 35.4%, while agricultural employment is expected to decline 37.5%. Table III-7 illustrates the projected employment patterns for each sector of the HRU economy through the year 2000.

Summary

The following provides a summary of some basic characteristics of each of the major economic sectors in the CNF's HRU:

Agriculture. Agricultural activities of farming and ranching played leading roles in the establishment of white settlements in the HRU. While its absolute importance to the economy continues to be significant, its relative predominance as a component of the base economy has slowly declined. Agriculture in the HRU has conformed to national trends away from small-scale family operations and toward large-scale, capital-intensive corporate farming. The trend toward agribusiness has been characterized by larger farms, higher productivity, reduced labor needs, and the stagnation and decline of the agricultural service sector upon which several communities in the HRU had been dependent.

The most important limiting factor for agriculture is water availability, especially for farmers dependent upon groundwater for irrigation. Agriculture, by far the major consumer of limited water supplies, faces the pressures of groundwater depletion and competition from municipal, industrial, and Indian users.

Agriculture is presently an insignificant and declining source of employment in the HRU with only 1.7% of the labor force employed in the sector in 1977 (down from 2.5% in 1971). Total employment in the sector declined 12.5% between 1971 and 1977, while total employment in the HRU increased about 23% during the same period. Of the major economic sectors, agricultural employment is the most equitably distributed among the four counties of the HRU. In 1977, slightly less than one-half (48%) of all agricultural employees were employed in Pima County, 30.5% in Cochise, 17.6% in Graham County, and 3.8% in Santa Cruz County. Agriculture is a more important source of employment in Graham County than in the other three counties, employing 10.2% of its labor force in 1977. Agricultural employment has the least relative significance in Pima County, where only .9% of the labor force is employed in the sector.

With the exception of Graham County, all counties in the HRU experienced significant losses in agricultural employment for 1971-77. Employment levels remained stable in Graham County but declined 45.6% in Santa Cruz County, 21.3% in Cochise County, and 5.6% in Pima County.

In 1975, income (personal, labor and proprietor) which accrued from agriculture in the four counties was about \$44.9 million dollars, an increase of 74.4% over 1970. 34.7% of all agricultural income was contributed by

Table III-7: Historic and Projected
Employment Patterns, 1971-2000
(Percent of Total Employment)

| <u>County</u> | Agriculture | | | | Mining | | | | Manufacturing | | | |
|---------------|------------------------------|------|------|------|----------------------------|------|------|------|--------------------|------|------|------|
| | 1971 | 1980 | 1990 | 2000 | 1971 | 1980 | 1990 | 2000 | 1971 | 1980 | 1990 | 2000 |
| Cochise | 6.7 | 3.2 | 2.3 | 1.8 | 8.6 | 0.7 | 0.6 | 0.5 | 7.6 | 5.8 | 6.7 | 7.6 |
| Graham | 11.5 | 8.6 | 5.9 | 4.9 | 1.4 | 5.1 | 17.8 | 17.5 | 3.2 | 5.5 | 4.7 | 4.7 |
| Pima | 1.3 | 0.7 | 0.4 | 0.3 | 5.0 | 4.4 | 4.0 | 3.2 | 6.7 | 7.2 | 7.5 | 7.9 |
| Santa Cruz | 4.5 | 2.1 | 1.4 | 1.1 | 0.9 | 0.3 | 0.2 | 0.2 | 8.2 | 7.6 | 8.1 | 8.5 |
| Totals | 2.5 | 1.3 | 0.8 | 0.5 | 5.2 | 3.8 | 3.8 | 3.1 | 6.8 | 7.0 | 7.3 | 7.8 |
| <u>County</u> | Construction | | | | Trans., Commun., & Pub.Ut. | | | | Wholesale & Retail | | | |
| | 1971 | 1980 | 1990 | 2000 | 1971 | 1980 | 1990 | 2000 | 1971 | 1980 | 1990 | 2000 |
| Cochise | 3.2 | 3.5 | 2.2 | 2.0 | 4.2 | 2.9 | 2.6 | 2.2 | 13.8 | 12.6 | 13.5 | 14.3 |
| Graham | 2.3 | 7.4 | 2.9 | 2.9 | 2.8 | 2.0 | 1.6 | 1.2 | 14.3 | 17.2 | 16.3 | 16.6 |
| Pima | 7.8 | 5.8 | 6.7 | 7.6 | 4.6 | 4.2 | 3.5 | 2.9 | 19.1 | 19.3 | 19.7 | 19.7 |
| Santa Cruz | 5.5 | 2.9 | 2.8 | 2.6 | 5.9 | 4.9 | 4.0 | 3.1 | 11.8 | 39.5 | 41.3 | 43.2 |
| Totals | 7.0 | 5.4 | 5.9 | 6.6 | 4.5 | 4.0 | 3.3 | 2.8 | 19.0 | 19.0 | 19.6 | 19.9 |
| <u>County</u> | Finance, Ins., & Real Estate | | | | Services | | | | Government | | | |
| | 1971 | 1980 | 1990 | 2000 | 1971 | 1980 | 1990 | 2000 | 1971 | 1980 | 1990 | 2000 |
| Cochise | 1.9 | 1.6 | 1.7 | 1.9 | 7.2 | 8.9 | 9.0 | 9.0 | 31.5 | 53.8 | 54.1 | 53.3 |
| Graham | 1.4 | 1.7 | 1.6 | 1.5 | 10.1 | 13.0 | 12.2 | 12.6 | 21.2 | 29.3 | 27.7 | 28.3 |
| Pima | 3.8 | 3.6 | 3.6 | 3.5 | 15.7 | 18.0 | 18.3 | 18.1 | 22.6 | 28.9 | 29.0 | 30.0 |
| Santa Cruz | 2.7 | 3.1 | 3.0 | 3.9 | 15.9 | 13.0 | 13.5 | 13.8 | 16.8 | 19.2 | 18.8 | 18.3 |
| Totals | 3.5 | 3.2 | 3.3 | 3.3 | 14.4 | 16.4 | 16.8 | 16.7 | 23.5 | 31.9 | 31.7 | 32.0 |

Sources: Projections from Arizona OEPAD, Baseline Scenario and Projections for the Arizona Economic and Demographic Projection Model. 1971 figures from Arizona OEPAD, Arizona Community Profiles.

Cochise County, 33.2% by Pima, 29.2% by Graham, and 2.9% by Santa Cruz in 1975. In 1970, 42% of all agricultural income was found in Pima County, 29.9% in Cochise, 23% in Graham, and 5% in Santa Cruz. Despite these overall gains, agricultural jobs are very low-paying. In the major agricultural counties of Graham, Cochise, and Pima, agriculture contributed only .4% of the total non-governmental payroll, well below the 2.5% of the total non-governmental labor force employed in agriculture in the three counties.

For the HRU, agricultural income was 2.2% of all income (personal, labor, and proprietor's) in 1977. Next to government, agriculture is the most important source of income in Graham County, contributing about 26% of all income in 1977 (up from 21.1% in 1970). For the other counties, the percent of all income contributed by agriculture in 1977 was 5.6% in Cochise County (4.1% in 1970); 2.2% in Santa Cruz County (3.8% in 1970); and .9% in Pima County (1.1% in 1970).

Mining. In a recent issue of the Arizona Review (August-September 1978) the mining industry was called the "one bleak spot" in Arizona's economy. It reported that during the first half of 1978 sales decreased 12% in Pima County, employment dropped 22% and payrolls declined 15%. The copper industry peaked in 1974, but has since been depressed due to weak demand and low prices. A major strike in mid-1977 added to the industry's troubles. While copper producing areas in Pima, Pinal, and Cochise counties have suffered, one bright spot promises to be the Safford area, which will become a center of expanded activities in the near future due to Phelps-Dodge's new Metcalf Mine.

In 1977 4.1% of the HRU labor force was employed in mining (5.2% in 1971). Change in total mining employment between 1971 and 1977 was 19.2% (compared to 23% increase in total employment for the same period). Between 1971 and 1977, total mining employment increased 22.4% in Pima County and 133% in Graham County, while it decreased 79% in Cochise and 70% in Santa Cruz. In 1977 about 93.8% of mining employees were employed in Pima County, 4.2% in Cochise, .2% in Santa Cruz, and about 2% in Graham. In 1977, about 4.5% of Pima County's labor force was employed in mining (5% in 1971), about 2.9% of Graham's (1.4% in 1971), 2.1% of Cochise's (8.6% in 1971), and .1% of Santa Cruz's (.9% in 1971).

In 1976, 12.2% of the non-government payroll in Pima County came from mining, while about 6.9% of non-government employees were in mining in that county (1977).

In 1975, 7.6% of income to labor and proprietors came from mining. Total labor income from mining in Pima County rose 77.7% between 1970-1975, greater than the rise in total labor income in Pima of 70.6%, but less than the rise in income from all sources of 80.5%.

Manufacturing. The most significant recent event in this sector has been the move if IBM facilities to the Tucson area from Boulder and San Jose. IBM intends to employ 5000 people at the new facility, thereby strengthening the area's relatively weak manufacturing industries and permitting further economic diversification.

In 1977 6.7% of the HRU labor force was employed in manufacturing sectors (6.8% in 1971). Total employment in manufacturing rose 29%, a rate of increase 6% greater than that of total employment for the same period. Between 1971 and 1977, total manufacturing employment rose about 42.7% in Pima, 51.6% in Santa Cruz, and 28.6% in Graham, and declined about 55.9% in Cochise County.

Manufacturing employment in the HRU is concentrated in Pima County, where 88.9% of workers employed in the sector are found. Seven percent of Pima County's labor force is employed in manufacturing, making it the principal employer among the basic sectors of manufacturing, mining, and agriculture. Manufacturing also provided employment for 8.7% of the labor force in Santa Cruz in 1977, where it is also the principal employer among the major basic sectors; 3.8% in Cochise County and 3.7% in Graham, where it is outranked by agriculture as a source of basic employment.

In 1976, about 15.8% of the non-government payroll was provided by manufacturing. 10.2% of non-government employees were in manufacturing in 1977.

In 1975 7.6% of labor income was contributed by manufacturing, which employed about 7.3% of all employees. Between 1970-1975 total labor income from manufacturing in Pima, Cochise and Santa Cruz counties increased 86.5%, well ahead of the 66.8% increase in all labor income for those counties for the same period.

Contract Construction. Construction went through a low level of activity in 1975-1976, but began to pick up in 1977 and continues to be strong. In the first half of 1978, residential construction awards rose 44% in Pima County, providing jobs for many former mining employees. In 1977, 4.7% of the HRU labor force was employed by this sector (7% in 1971). Between 1971-1977 total employment declined 12.8% in the HRU and was down 17% in Pima County. Pima County accounted for about 87.9% of all construction employment in 1977; 7.4% in Cochise, 2.9% in Santa Cruz, and about 1.7% in Graham. In 1977, 4.8% of Pima County's labor force was employed in this sector (7.8% in 1971), 4.2% in Cochise (3.2% in 1971), 3.17% in Santa Cruz (5.5% in 1971), and 2.19% in Graham (2.3% in 1971).

In 1976, 11.9% of non-government payroll was provided by construction. 7.1% of non-government employees were employed in this sector in 1977.

In 1975, 7.2% of all labor income came from contract construction, and about 5% of the labor force was employed in that sector in 1975. Total labor income rose 28.8% between 1970-1975 in Pima County.

Wholesale and Retail Trade. In the first half of 1978 this sector has suffered a decline, chiefly attributable to the depression in the copper mining industry.

An important outside source of income for this sector is visitors from Mexico. A recent report prepared by the University of Arizona's Division of Economic and Business Research reported that visitors from Mexico contributed

about \$213.3 million to the economy in Cochise, Santa Cruz, and Pima counties for the year ending March 1978. This figure represents 29% of the HRU's tourist and travel dollars for 1977. Almost two-thirds (64.5%) of this impact was felt in Nogales, 18.4% in Tucson, and 11.3% in Douglas. Because of Nogales' strong dependence upon border trade, it is particularly sensitive to the value of the U.S. dollar relative to the Mexican peso. A recent study cited in the UA report found the impact of peso devaluation to have been particularly hard on Nogales, while Douglas was less affected, and Tucson was only mildly affected.

A survey of a sample of Mexican citizens entering Arizona found that 11.5% of the sample gave tourism and travel-related activities as either their primary or secondary purpose for coming into Arizona. The majority (60.5) of responses cited shopping as the primary reason.

Total expenditures of Mexican visitors to Pima, Cochise, and Santa Cruz counties for April 1977-March 1978 were \$213,257,000. Expenditures in department stores was the largest contributor (52.9%). Business expenditures (17.2%) and grocery shopping (11.5%) were also significant expenditure categories. Tourism related expenditures of lodging, restaurant food, and transportation contributed about \$23.3 million to the tri-county economy, 10.9% of total expenditures.

In 1977, 17.9% of the HRU labor force was employed in this sector (19% in 1971). Between 1971 and 1977, total employment in the sector increased about 22.3%. In 1977 Pima County accounted for 89.4% of employment in this sector; 6.6% in Santa Cruz, 1.3% in Cochise, and 2.6% in Graham. In 1977, 18.9% of Pima County's labor force was employed in wholesale and retail trade (19.1% in 1971). Cochise and Graham show similar figures to Pima. 32.3% of Santa Cruz employment was in this sector in 1977 (41.8% in 1971).

In 1976, the sector's payroll was 27.6% of the total non-governmental payroll. In 1977 the sector employed 27.2% of non-government workers.

In 1975, 14.9% of labor income came from wholesale and retail trade, and about 17.7% of employed persons had jobs in that sector. Total labor income rose 62.2% between 1970-75.

Services. Like the wholesale and retail trade sector the vitality of this sector is strongly dependent upon activity in the basic sectors, but to the extent they are dependent upon expenditures from tourism and travel, and this dependence is considerable, they can be considered a basic economic sector. The travel and tourism industry is highly seasonal with greatest activity occurring during the winter months; however, during the summer of 1978 notable gains were achieved as visitors increased 30% over the summer of 1977. The most popular outdoor attractions for visitors are Saguaro National Monument and the Chiricahua National Monument.

In 1977, 15.8% of the labor force was employed in the services sector (14.4% in 1971). Change in total employment in the sector for 1971-1977 showed an increase of 40.7% (43.3% in Pima County). In 1977, 88.9% of employees in this sector were employed in Pima County; 6.5% in Cochise, 2.5%

in Santa Cruz, and 2.2% in Graham. In 1977 Pima County had a greater percentage of employees in the service sector (16.5%) than did the other three counties (12.1% Cochise, 11.9% Graham, and 10.8% Santa Cruz).

In 1976 the sector contributed 22.2% of non-government labor income to the HRU, while employing 23.9% of the non-governmental labor force.

In 1975 the services sector contributed 17% of all personal labor income. Labor income for the sector rose 72.5% from 1970-1975.

Transportation, Communication, and Public Utilities. In 1977 4.1% of the labor force was employed in this sector. 4.5% in 1971. Change in total employed from 1971-1977 showed an increase of about 17.8%. In 1977 about 88% of this sector was employed in Pima County, 5.3% Santa Cruz, 5.2% Cochise, and 1.4% Graham. In 1977, 4.3% of Pima County's labor force was employed in this sector (4.6% in 1971), 6% in Santa Cruz (5.9% in 1971), 2.5% in Cochise (4.2% in 1971), and 2% Graham (2.8% in 1971).

In 1976 the \$87.4 million payroll accounted for 8.3% of the total non-government payroll for the HRU; in 1977, 6.2% of non-government employees employed in this sector.

In 1975, 5.8% of total labor income for HRU was contributed by this sector. Total labor income rose 76.8% from 1970-1975.

Finance, Insurance, and Real Estate. 3.4% of the total labor force was employed in this sector in 1977 (3.5% in 1971). 88.9% of employees in this sector were employed in Pima County in 1977, 6.3% in Cochise, 3.4% in Santa Cruz, and 1.4% in Graham. Change in total employment in this sector from 1971-1977 showed an increase of 26.3%. The sector is a minor source of employment throughout the HRU, employing 3.5% of Pima County's labor force, 3.2% of Santa Cruz's, 2.5% of Cochise's, and 1.6% of Graham's.

In 1976, this sector was responsible for 6.5% of non-government payroll, while employing 5.1% of non-government employees.

In 1975, 3.7% of all labor income was contributed by this sector. Total income for the sector rose 49.7% during 1970-1975.

Government. A major source of employment throughout the HRU is the governmental sector. In 1977 24.6% of the labor force was employed by the government (23.5% in 1971). From 1971-1977, total employment increased 35.7%. In 1977, 78% of this sector was employed in Pima County, 16.5% in Cochise, 2.2% in Santa Cruz, and 3.3% in Graham. Government employment is most important in Cochise County, where in 1977 nearly half (48.1%) of the labor force was employed by the government. 27.9% of the labor force in Graham county is employed by the government, 22.6% in Pima, and 14.9% in Santa Cruz.

In the 1970's government has also been the most important source of personal labor income, accounting for 32.1% in 1975. Personal income from government increased 73.2% from 1970-1975. Of total personal income from government, over half (53.9%) is from state and local governments, and the other half is nearly equally divided between federal civilian (24.2%) and federal military (23.6%).

THE POLITY: THE INSTITUTIONAL FRAMEWORK OF THE CNF HRU

Introduction

The purpose of this section of the overview document is to describe briefly the institutional framework for forest land management in the CNF HRU. First, it identifies the institutions, both governmental and non-governmental, which may impact, or be impacted by, management of the CNF. Second, it outlines several pressing natural resource policy issues within the states of Arizona and New Mexico that may affect forest management. Finally, it summarizes some of the planning efforts currently in progress in the two states which are designed to address those policy issues. Overall, the section represents an initial step toward understanding how planning and decision-making activities in the CNF are related to the larger polity within which the forest operates.

Governmental Organizations in the CNF HRU

The activities of the CNF are related to the activities of other governmental entities at the federal, state and local levels. These institutions and their importance to the CNF are discussed below.

The Federal Level

Federal Agencies. Table III-8 illustrates the broad range of federal agencies with responsibilities for natural resources and land use, agencies whose activities may at one time or the other require coordination with the CNF. The table includes several land management agencies that control substantial amounts of land in Arizona and New Mexico, such as the Bureau of Land Management, the Forest Service, the National Park Service, the Fish and Wildlife Service, and the Bureau of Reclamation. It also points out the importance of the U.S. Environmental Protection Agency, which has lead regulatory and enforcement responsibilities in the areas of air and water pollution, pesticides, solid wastes and toxic substances. The table also indicates the roles of agencies such as the Soil Conservation Service and the Heritage Conservation and Recreation Service, agencies which do not have major land management responsibilities but which do play important roles in developing and implementing resource conservation programs. Finally, the table illustrates that agencies not ordinarily considered resource-related also administer programs that directly affect management of natural resources and land use.

Table III-8: Federal Agencies with Responsibilities for Natural Resources and Land Use

| | NATURAL RESOURCES | | | | | LAND USE | | | | | | | | | |
|----------------------|-------------------|--------------|---------------|-------------|-------|--------------------|---------|-----------|------------------------|------------|----------|-------------|-------------|--------|-----------------|
| | Energy | Water Supply | Water Quality | Air Quality | Soils | Location of Growth | Housing | Utilities | Recreation and Tourism | Open Space | Forestry | Agriculture | Solid Waste | Mining | Other Land Uses |
| Dept. of Agriculture | | | | | | | | | | | | | | | |
| ARS | o | o | o | o | | | | | | | | o | | | |
| ASCS | | | | | o | o | | | | o | o | X | | | o |
| FmHA | X | X | | o | | | X | X | o | | | o | X | | |
| NFS | o | o | o | o | o | | o | | o | o | X | o | | | |
| SCS | X | o | | X | o | | | | o | o | | o | | | o |
| Dept. of Commerce | | | | | | | o | o | | | | | | | |
| EDA | | | | | | | | | | | | | | | |
| FCRC | o | o | | | | | o | | | | | | o | | |
| SWBRC | o | o | | | | | o | | | | | | o | | |
| Dept. of Defense | | | | | | | | | | | | | | | |
| ACE | o | X | o | | o | | | | o | | | | | | |
| EPA | o | X | X | X | o | | | X | | | | X | | o | |
| Dept. of HEW | | | | | | | | | | | | | | | |
| PHS | | o | o | | | | | | | | | | | | |
| Dept. of HUD | | | | | | | | | | | | | | | |
| CP&D | o | o | o | o | | | X | X | o | o | o | o | o | o | o |
| FHA | | | | | | | | X | | | | | | | |
| Dept. of Interior | | | | | | | | | | | | | | | |
| USGS | | | o | | | | | | | | | | o | o | |
| BIA | o | o | | o | o | o | o | o | o | o | o | o | o | o | o |
| BLM | o | o | o | | o | o | | | o | o | o | o | o | o | o |
| BOM | | | | | | | | | | | | | | | o |
| HCRS | | o | | | o | | | | X | | | | | | |
| NPS | | | | | | | | | | X | o | | | | |
| BR | o | X | o | o | o | o | | | o | o | o | | | | |
| FWS | o | o | o | | | X | | | o | o | | | | | |
| SBA | o | o | | | | | | | | | | | | | |
| Dept. of State | | | | | | | | | | | | | | | |
| IB&WC | o | o | o | | | | | | | | | | | | |
| Dept. of Trans. | | | | | | | | | | | | | | | |
| FHWA | | | | | | o | | o | o | o | o | | | | o |
| WRC | | | X | X | | | | | | | | | | | |
| Interstate Groups | | | | | | | | | | | | | | | |
| Salinity Forum | | | | | X | | | | | | | | | | |
| WSWC | o | X | X | | | | | | | | | | | | |

Key: o - Some responsibilities
 X - Lead agencies

Sources: Ralph Kingery and Mike Silverman. 1977. Roles and responsibilities of state and federal agencies involved in growth policy elements. Arizona Office of Economic Planning and Development, Phoenix. Unpublished document; and Jacqueline Rich. 1977. The federal role in water quality management. Office of Economic Planning and Development, Phoenix.

Table III-8 (continued)

Abbreviations Used in the Table:

ARS - Agriculture Research Service
ASCS - Agriculture Stabilization and Conservation Service
FmHA - Farmers Home Administration
NFS - National Forest Service
SCS - Soil Conservation Service
EDA - Economic Development Administration
FCRC - Four Corners Regional Commission
SWBRC - Southwest Border Regional Commission
ACE - Army Corps of Engineers
EPA - Environmental Protection Agency
PHS - Public Health Service
CP&D - Community Planning and Development
FHA - Federal Housing Administration
USGS - Geological Survey
BIA - Bureau of Indian Affairs
BLM - Bureau of Land Management
BOM - Bureau of Mines
HCRS - Heritage Conservation and Recreation Service
NPS - National Park Service
BR - Bureau of Reclamation
FWS - Fish and Wildlife Service
SBA - Small Business Administration
IB&WC - International Boundary and Water Commission
FHwA - Federal Highway Administration
WRC - Water Resources Council
WSWC - Western States Water Council

Three other federal entities not included in the table but which are nevertheless important to management of the CNF are the U.S. Customs Bureau of the Department of the Treasury, the U.S. Border Patrol of the Department of Justice, and the Ft. Huachuca Military Reservation of the U.S. Department of the Army. The location of units of the CNF adjacent to the Mexican border relates management of the CNF to the law enforcement activities of both the Customs Bureau and the Border Patrol. The Army's management of 113,000-acre Ft. Huachuca primarily for non resource-related purposes can also have significant resource allocation consequences for adjacent forest land in the Huachuca Mountains.

Finally, Indian tribes, whose lands are reserved in trust by the federal government, are not included in the table. However, they are important political actors in the states of Arizona and New Mexico. And, as resource scarcity increases, the tribes, many of which occupy resource-rich land and have significant claims to the area's water supply, are bound to become even more important politically. There are three Indian reservations located within the CNF HRU: the San Carlos, the Papago, and the San Xavier.

The Congressional Delegations. There are three congressional districts represented within the CNF HRU, two in Arizona and one in New Mexico. Most of the units of the CNF are located in the Second Arizona Congressional District, which is represented by Morris K. Udall (D), Chairman of the House Interior and Insular Affairs Committee. The other two districts include the Fourth Arizona Congressional District, which is represented by Eldon Rudd (R), and the Second New Mexico Congressional District, which is represented by Harold L. Runnels (D). Rudd and Runnels are both members of the House Interior and Insular Affairs Committee. The relation of the CNF HRU to Arizona's congressional district boundaries is shown in Figure III-2 while Figure III-3 illustrates the boundary relationship in New Mexico. U.S. Senators from the two states are Barry Goldwater (R) and Dennis DeConcini (D) of Arizona, and Peter Domenici (R) and Harrison Schmitt (R) of New Mexico.

Governmental agencies and special interests contact congressional representatives for a number of reasons. They may want to lodge a complaint or appeal a Forest Service decision, or they may desire to circumvent the agency altogether and work toward a congressional resolution of an issue involving the forest. Alternatively, the CNF regularly contacts the congressional offices to inform them of major agency actions and to alert them to possible constituency reactions. Because of the forest's interactions with the congressional offices, and especially on matters of a controversial nature, the congressional delegations are salient components of the CNF HRU.

The State Level

Executive Agencies in Arizona. Arizona is headed by a plural executive. The governor, secretary of state, attorney general, state treasurer, state superintendent of public instruction, state mine inspector and three corporation commissioners share executive power. Their offices are independently provided for in the state constitution and each is elected directly by the

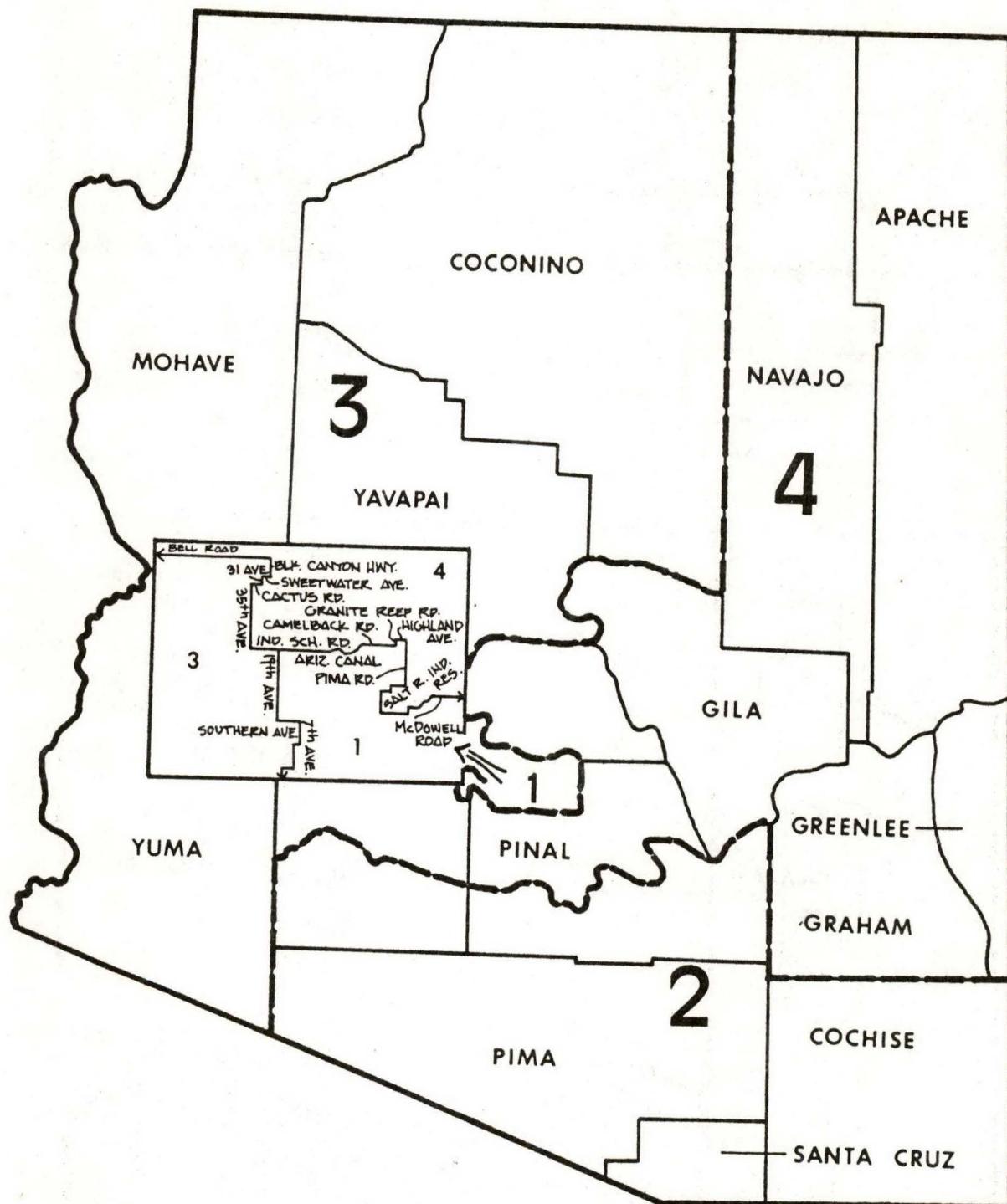


Figure III-2: Arizona Congressional Districts.

Source: Arizona Legislative Review, 1978. Phoenix.

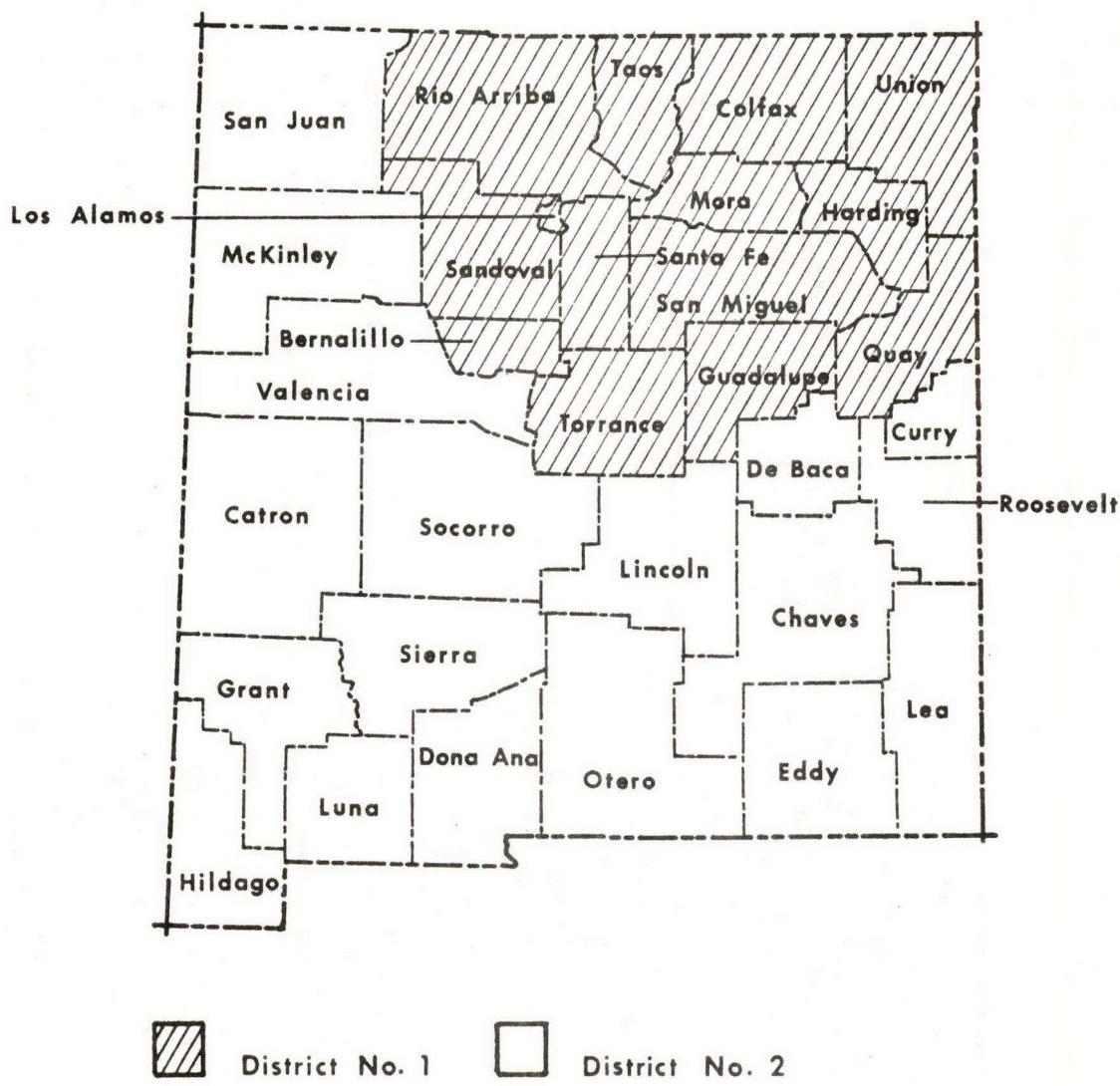


Figure III-3: New Mexico Congressional Districts.

Source: New Mexico Secretary of State. New Mexico Blue Book, 1975-76. Office of Secretary of State, Santa Fe.

voters in statewide contests. The 1978 election saw a mix of Republicans and Democrats elected to these posts, headed by the election of Bruce Babbitt (D) to the governorship, the leading executive post.

The administrative framework for natural resource management is also fragmented. Numerous agencies, each with its special area of resource concern and its own particular clientele groups, have roles and responsibilities related to natural resources and land use. Table III-9 lists the approximately twenty state agencies whose natural resource and land use programs and activities may impact the CNF HRU. Many of these agencies are responsible to their own board or commission, not to the governor, a situation which further complicates state efforts to deal with resource matters in a comprehensive manner. Often each agency must be consulted to determine its independent interest and position regarding important resource questions. While there have been repeated proposals to reorganize several of these entities into a department of natural resources that would be under the control of the governor, there has been strong resistance to such proposals. Thus, Arizona's plural executive, further fragmented by the large number of autonomous boards, agencies, and commissions, results in many independent centers of power at the state level with which the CNF must potentially deal.

Executive Agencies in New Mexico. Because almost all of the CNF is located within the state of Arizona, executive agencies in Arizona are more likely to be involved with the activities of the CNF than agencies in New Mexico. However, on issues concerning the Peloncillo subdivision of the Douglas Ranger District, a subdivision which lies largely in New Mexico, agencies and officials of the state of New Mexico may become involved.

Like Arizona, New Mexico has a plural executive: a governor and his lieutenant governor, a secretary of state, state auditor, state treasurer, attorney general, commissioner of public land and three corporation commissioners. While Democrats were elected to all of these posts in the 1978 general election, the independence of the elected offices nonetheless results in divided executive authority.

New Mexico also has a number of appointed boards and commissions over which the governor has only limited authority. Table III-10 lists several of the state executive agencies and departments with responsibilities for natural resources and land use. However, a major governmental reorganization in 1978 did result in the consolidation of several of these agencies, and New Mexico now has by law twelve cabinet departments which report directly to the governor. The newly-elected governor, Bruce King (D), is, as of this writing, in the process of selecting the members of his cabinet.

The State Legislatures. The Arizona State Legislature is composed of a 30-member Senate and a 60-member House. All members serve two-year terms and are elected in November of each even-numbered year. In the 1978 election, Republicans gained control of both houses, reversing a narrow Democratic hold on the Senate and increasing their previous strength in the House to almost two-thirds. Republicans now control the Senate 16 to 14 and the House 42 to 18. The Arizona legislative districts in relation to the CNF HRU are shown in Figure III-4. Party affiliations of Arizona legislators representing

Table III-9: Arizona State Agencies with Responsibilities for Natural Resources and Land Use

| | NATURAL RESOURCES | | | | | LAND USE | | | | | | | | |
|----------------------|-------------------|--------------|---------------|-------------|-------|--------------------|---------|--------|--------------------|------------|----------|-------------|-------------|-----------|
| | Energy | Water Supply | Water Quality | Air Quality | Soils | Location of Growth | Housing | Mining | Recreation/Tourism | Open Space | Forestry | Agriculture | Solid Waste | Utilities |
| Ag. & Hort. | | | | X | o | | | | | | | | | |
| Az. AEC | X | o | o | o | | | | | | | | | o | |
| B. Geo. & Min. Tech. | | | | | o | o | | | | | | | | |
| ACC | o | o | | | | o | | | | | | | X | o |
| OEPAD | o | o | | | | X | o | | | | | | | |
| Game & Fish | | o | o | | X | | | | X | | | | | o |
| DHS | | X | X | X | o | | o | o | o | o | o | o | X | X |
| SLD | o | X | o | o | X | o | o | X | o | X | X | o | o | X |
| Livestock S. Bd. | | | | | | | | | | | | X | | |
| Mineral Res. | | | | | | | | | X | | | | | |
| Oil & Gas | X | o | o | | | o | | X | | | | | | |
| AORCC | | o | o | | o | | | | X | X | | | | o |
| Parks Bd. | | | | | o | | o | X | | | | | | o |
| Pest. Cont. Bd. | | | | | | | | | | | | X | | |
| APA | X | o | o | | | o | | | o | | | | | X |
| PP & TLSC | X | o | o | o | o | o | o | o | o | o | o | o | o | X |
| Real Estate | | | | | | | | | | | | | | o |
| ADOT | o | o | o | o | o | o | o | o | o | o | o | o | o | o |
| Water Com. | o | X | o | | o | o | o | o | | | o | o | o | |
| W.Q.C.C. | | | X | | | | | | | | | | | |

Key: o - Some responsibilities
X - Lead agencies

Sources: Ralph Kingery and Mike Silverman. 1977. Roles and responsibilities of state and federal agencies involved in growth policy elements. Office of Economic Planning and Development, Phoenix. Unpublished document; and Jacqueline Rich. 1977. Arizona's role in water quality management: State agency programs and land and water resource controls. Arizona Office of Economic Planning and Development, Phoenix.

Abbreviations Used in the Table:

- Ag. & Hort. - Commission of Agriculture and Horticulture
- Az. AEC - Arizona Atomic Energy Commission
- B. Geo. & Min. Tech. - Bureau of Geology and Minerals Technology
- ACC - Arizona Corporation Commission
- OEPAD - Office of Economic Planning and Development
- Game and Fish - Arizona Game and Fish Commission
- DHS - Department of Health Services
- SLD - State Land Department
- Livestock S. Bd. - Livestock Sanitary Board
- Mineral Resources - Mineral Resources Board of Governors
- Oil & Gas - Oil and Gas Conservation Commission
- AORCC - Arizona Outdoor Recreation and Coordinating Commission
- Parks Bd. - State Parks Board
- Pest. Cont. Bd. - Pesticide Control Board
- APA - Arizona Power Authority
- PP & TLSC - Power Plant and Transmission Line Siting Committee
- Real Estate - Real Estate Commission
- ADOT - Arizona Department of Transportation
- Water Com. - Water Commission
- W.Q.C.C. - Water Quality Control Council

Table III-10: New Mexico State Agencies with Responsibilities Related to Natural Resources and Land Use

Agriculture Department

Commerce and Industry Department

Energy and Minerals Department
Oil Conservation Commission
State Geologist

Environmental Improvement Division of the Health and Environment Department

Natural Resources Department
Division of Fish and Wildlife
Division of Forestry
Division of Parks and Recreation
Division of Soil and Water Conservation
Division of Water Resources

State Land Office

State Planning Office

Transportation Department

Water Quality Control Commission

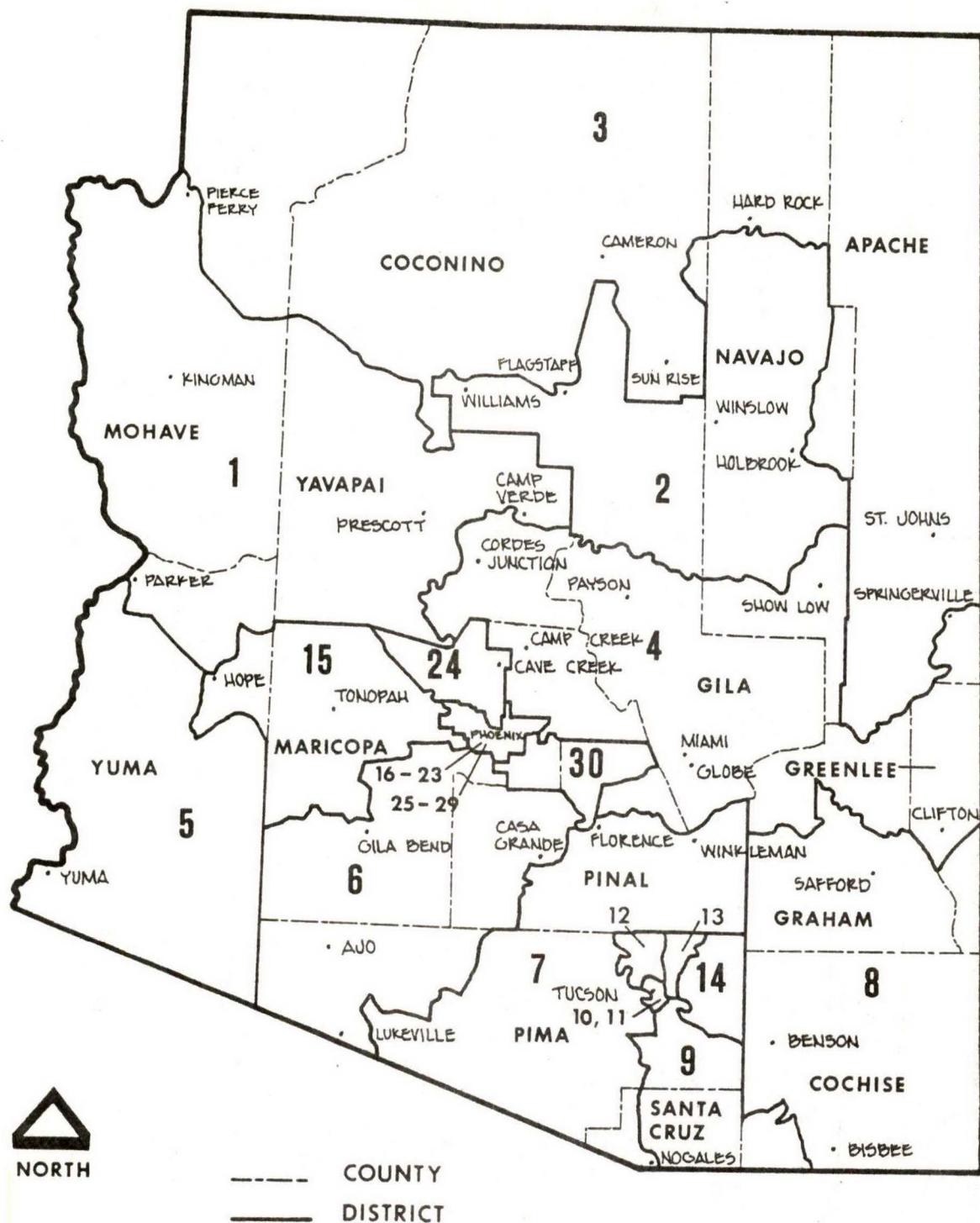


Figure III-4: 1978 Arizona Legislative Districts.

Source: Arizona Legislative Review, 1978, Phoenix.

areas included within the CNF HRU are indicated in Table III-11. As the table shows, much of the Democratic strength in the legislature comes from this area.

In recent years the trend has been for the Pima County delegation to the legislature to be composed of mostly moderate to liberal Democrats. These Pima Democrats have been more favorably disposed toward proposed land use and environmental legislation than the legislature as a whole which is chary of governmental interference with property rights and which opposes environmental regulations that may interfere with economic development. The overall conservative orientation of the Arizona legislature has come from conservative Republicans located in populous Maricopa County (Phoenix) and from conservative Democrats located in areas of southeast Arizona other than Pima County.

In New Mexico there is a 70-member House and a 42-member Senate, with House members serving two-year terms and Senate members serving four-year terms on a staggered basis. In the 1978 election, the Democratic incumbent won reelection to the Senate in District 35, which includes Sierra, Luna and Hidalgo counties. The Republican incumbent, who ran unopposed, also won reelection to the House in District 32, which includes Hidalgo County and part of Luna County.

Overall, the New Mexico legislature remains heavily Democratic, with Democrats holding a 41 to 29 edge in the House and a 33 to 9 majority in the Senate. Despite these heavy Democratic majorities, however, there are considerable divisions among the Democrats in the legislature, and party politics statewide is generally characterized as semicompetitive (Hain, 1976, 201-218).

Legislatures in the two states are part-time activities, and part-time legislatures simply do not have enough time to study the great number of issues that require legislative attention. Problems frequently go unattended or are given inadequate consideration; no policy or bad policy is often the result. Legislative salaries also reflect the part-time nature of the two legislatures. Remuneration in Arizona is \$6,000 a year plus certain travel and subsistence expenses; remuneration in New Mexico is \$40 a day for expenses with some additional modest travel allowances. Not only do limited legislative salaries affect the quality of legislators and increase legislative turnover, but they also most certainly mean that persons serving in the legislature must either have independent sources of income or devote a considerable portion of their time and effort to their own business affairs. To the extent that state legislative action can often either impede or facilitate the resolution of issues affecting the CNF, these legislative inadequacies can diminish legislative capabilities to provide timely and needed input into policy formation on public issues of concern to the CNF.

The Local Level

There are a multitude of substate units of government within the CNF HRU. These local units provide a broad range of governmental services

Table III-11: Party Affiliations of Arizona State Legislators in the CNF HRU

| <u>1979-80 Senate</u> | | <u>1979-80 House</u> | |
|-----------------------|---------------|----------------------|----------------|
| <u>District</u> | <u>Party</u> | <u>District</u> | <u>Party</u> |
| 4 | D | 4 | 2D |
| 6 | D | 6 | 1D; 1R |
| 7 | D | 7 | 2D |
| 8 | D | 8 | 1D; 1R |
| 9 | R | 9 | 2R |
| 10 | D | 10 | 2D |
| 11 | D | 11 | 1D; 1R |
| 12 | R | 12 | 1D; 1R |
| 13 | D | 13 | 1D; 1R |
| 14 | R | 14 | 2R |
| | <u>7D; 3R</u> | | <u>11D; 9R</u> |

Key: D - Democrat
 R - Republican

Source: Arizona legislative review. 1978. Phoenix.

directly to the local citizenry, including: fire and police protection, public health services, public utility services, sewage and sanitation facilities, educational programs, and parks and recreation facilities. General descriptions of four types of local governmental units--counties, municipalities, special districts, and councils of government--are presented below.

Counties. Counties in Arizona and New Mexico are similarly structured. The state legislatures determine the functions, authority, power and responsibilities of the counties, which are primarily designed to serve the administrative purposes of the states. There are 14 counties in Arizona and 32 in New Mexico. (Arizona county boundaries are shown in Figure III-2; New Mexico's in Figure III-3.) County voters in both states elect a number of county officials including a Board of Supervisors (Board of County Commissioners in New Mexico), which serves as the chief legislative and administrative body, and a county sheriff, who serves as the chief law enforcement officer. The three areas in which the CNF is likely to have the most frequent interaction with the seven county governments located within the CNF HRU include law enforcement, planning and zoning, and road maintenance.

Municipalities. In Arizona, municipal government includes both cities and towns. Municipalities with more than 2,999 residents may become cities, while municipalities with fewer residents do not have that option. In turn, cities of more than 3,500 residents have the option of framing and adopting their own charters; the remaining cities and towns must operate under the general laws of the state. New Mexico law provides for three classes of municipalities based on population: cities, towns, and villages. However, in practice the distinction means little since most municipalities in the state exercise similar powers depending on their charters. Municipalities in both states also operate under a number of structural forms, including the mayor-council, council-manager, and commission-manager forms.

More specific economic and demographic data on the municipalities of Tucson, Nogales, Douglas, Sierra Vista and Safford have been presented earlier in this chapter.

Special Districts. In contrast to general purpose units of government such as counties and municipalities, special districts are governments of limited purpose. They are governments in that they are organized public entities which have considerable fiscal and administrative independence. They are limited because they provide only one or a few services. The boundaries of special districts may be coterminous with the jurisdictional boundaries of other local governmental units or they may overlap. Examples of the wide variety of special districts that can be found in the CNF HRU include: irrigation districts, soil and water conservation districts, water and sanitary districts, fire protection districts, flood control authorities, and resource conservation and development districts.

Councils of Government. Councils of government (COG's) are substate, regional planning and coordinating bodies. In addition to being charged with comprehensive planning for their respective regions, COG's also assist their members obtain and manage state and federal grants. Elected officials

from the general units of government located within the council area serve as the councils' policy-making body, but since membership is voluntary the COG's have no power to enforce their decisions. There are six COG's in Arizona, three of which serve the area within the CNF HRU: the Pima Association of Governments (Pima County and its incorporated municipalities), the Central Arizona Association of Governments (Gila and Pinal counties and their municipalities), and the Southeastern Association of Governments (Co-chise, Graham, Greenlee, and Santa Cruz counties and their municipalities). New Mexico has established eight COG's. The Southwestern New Mexico Council of Governments includes Hidalgo County.

Private Interest Groups in the CNF HRU

In reality, governmental agencies do not serve an undifferentiated public interest; rather, they react to and serve their own particular constituencies. An agency's constituency is "the number of groups and individuals over which it has, in some instances, jurisdiction, and with which it interacts in a variety of ways" (Woll, 1977, 65). It is those groups that benefit from agency activities or whose interactions must be taken into account when decisions are made. A strong constituency is an important variable for determining agency power. An agency which draws its constituency support from a variety of groups can play those groups off against each other. It can maintain a balance of political support over political opposition, and it can ensure that no one group possesses substantial control or veto power over agency activities (Woll, 1977, 65-68; Rourke, 1969, 64-69).

The CNF has a large and diverse constituency. Table III-12 lists some of the organized groups which are now, or which may be in the future, interested in management of the CNF, and which could potentially be activated to participate in support of, or in opposition to, agency positions on issues of concern to them. The list is not inclusive. Important groups may be latent, not emerging until some special set of circumstances or a single event precipitates their formation. Moreover, the list enumerates mainly groups based within the CNF HRU. Certain issues may, however, attract the attention and participation of politically potent groups located outside the CNF HRU, groups whose policy preferences may prevail over those expressed by local interests when final decisions are made. Finally, not all interests are articulated through organized interest groups. Individuals may also speak on behalf of their own economic and non-economic interests and concerns, and their impact may be just as significant as that of an organized group. On the CNF, grazing permittees are good examples of influential individual constituency interests.

Interest group politics has recently intensified. Election wins and losses are more frequently attributed to the activities of vocal and well-organized interest groups, and decision-makers report an increase in lobbying activities by groups concentrating on their own single, special issues (Newsweek, 1978). In this milieu of intensified interest group politics, the number of actual and potential special interests which may seek to

Table III-12: Interest Groups of Current or Potential Concern to the CNF

Environmental/Recreational/Conservation Groups

Albuquerque Jeepherders, Inc.
Amphi Hiking Club
Arizona Conservation Council
Arizona Habitat Association
Arizonans for a Quality Environment (AWWW)
Arizona Road and Trails Association, Inc.
Arizona State Association of Four-Wheel-Drive Clubs
Arizona Water Resources Committee
Arizona Wilderness Study Commission
Arizona Wildlife Federation
Blue Wilderness Committee
Central Clearing House
Coalition of Arizona Students for the Environment (CASE)
Defenders of Wildlife
Ducks Unlimited
Friends of the Chiricahua Wilderness
Friends of the Earth
Huachuca Audubon Society
Huachuca Conservation Council
Maricopa Audubon Society
Mearns Wildlife Society
Motorcyclists Association of New Mexico
National Campers & Hikers
National Wildlife Federation
Nature Conservancy
New Mexico Citizens for Clean Air and Water
New Mexico Conservation Coordinating Council
New Mexico Guide and Packers Association
New Mexico Wilderness Study Commission
New Mexico Wildlife Federation
Northern Arizona Audubon Society
Protectors of the Santa Catalina Mountains
Rio Rico Rod and Gun
Sahuaro Forest Associates
Santa Cruz Forum for the Greater Outdoors
Sierra Club
Sierra Vista Audubon Society
Southern Arizona Environmental Council
Southern Arizona Environmental Services
Southern Arizona Hiking Club
Southern Arizona Wildlife Callers
Tucson Audubon Society
Tucson Fourwheelers
Tucson Rod and Gun
Tucson Wheelmen
Wilderness Coalition, Southeast Arizona Chapter
Wilderness Society
Wildlife Unlimited

Business and Agriculture

Anamax Corporation
APCO
Arizona Cattlegrowers' Association
Arizona Farm Bureau Federation
Arizona Mining Association
Arizona Public Service
Cattlegrowers' Protection Association
Chambers of Commerce
Douglas
Nogales/Santa Cruz County
Safford-Graham County
Sierra Vista
Tombstone
Tucson
Willcox
Bisbee
Benson
Cochise Growers Association
Coronado Grazing Advisory Board
Earth Sciences, Inc.
Federal Timber Purchasers Assoc., Southwest Forest Resources Affairs
Graham County Cattlegrowers' Association
Graham County Cooperative
Grain Cooperative of Arizona
Kerr-McGee Corporation
Kennecott Corporation
New Mexico Cattlegrowers' Association
New Mexico Coal and Gas Association
New Mexico Mining Association
New Mexico Woolgrowers, Inc.
Oracle Ridge Mining Partners
Phelps Dodge Corporation
San Rafael Valley Grazing Association
Sahuaro Forest Associates
Small Miners Association
Southern Pacific Railroad
Southwest Forest Industries
Southwestern Minerals Exploration Association
Tucson Gas and Electric

Citizens Groups

Common Cause
League of Women Voters
Society for the Prevention of Cruelty to Animals

Professional Groups and Associations

American Institute of Architects
American Institute of Planners
American Society of Landscape Architects
Arizona Association of Counties
Arizona League of Cities and Towns
Association of Arizona County Planning Directors
Mining and Metallurgical Society of America
Planning Association of America
Society of Professional Foresters
Society of Range Management, Arizona Section
Society of Range Management, New Mexico Section

Museums/Natural History

Arizona-Sonora Desert Museum
Nature Conservancy
New Mexico Institute of Natural History
Research Ranch, Inc.
Southwestern Research (American Museum of Natural History)
Tucson Botanical Gardens, Inc.

Others

Boy Scouts
Girl Scouts
Homeowners Associations
 Mt. Lemmon Homeowners Association
 Turkey Flat Summer Home Association
Pima County Search and Rescue
Salvation Army
Smithsonian Astronomical Observatory at Mt. Hopkins
YMCA

Sources: K. Abrahams, H. Cortner, and M. McCarthy. 1976. Arizona land use reference manual. University of Arizona School of Renewable Natural Resources, Tucson. 59 pp.; Governor's Commission on Arizona Environment. 1978. Directory of Arizona environmental and conservation organizations, Phoenix; CNF public involvement program materials; RARE II draft environmental impact statement mailing list; discussions with CNF district rangers.

participate directly in the planning and decision-making processes of the CNF is likely to increase extensively and rapidly in the near future.

Political Structure of the CNF HRU in Perspective

The catalog of governmental organizations and private interest groups presented above illustrates the diverse and complex nature of the political structure of the CNF HRU. These federal and state agencies, congressional delegations, state legislatures, counties, municipalities, special districts, councils of government, and private interest groups--a mosaic of multi-layered and overlapping institutions and interests--may all impact, or be impacted by, management of the CNF.

The physical fragmentation of the CNF contributes to the complexity of the political setting. The forest's relatively small land base of 1,800,000 acres is divided into twelve small units spread among seven counties in two states. This feature, one not shared by many other national forests, undoubtedly expands the number of governmental units and private interests that may potentially be involved with issues of forest management. Moreover, the activities of each unit's neighboring land owners and its nearby communities can potentially have significant political, social, and economic impacts on the forest. Larger national forests whose management units are contiguous can perhaps more easily absorb many of these impacts.

Coordination of CNF programs and activities with this array of government institutions and interests is a challenging management task. Mechanisms at the federal level, such as the federal regional councils, which have been developed to coordinate the activities of the various federal agencies and to eliminate interagency conflicts, have never really proven successful (Derthick, 1974). At the state level, there is often no such thing as a unified coordinated state response on important natural resource issues. Instead, as was previously noted, the independence of many state offices and agencies means that each agency must often be consulted to obtain its independent interests and positions. Intergovernmental coordination mechanisms in the two states, which are designed to link federal and local governmental activities and programs to those of the states, in practice do little more than facilitate the flow of paperwork associated with federal grant applications and the review of federal environmental impact statements (Cortner, 1977).

Natural resource planning and decision-making within the CNF HRU consequently remains fragmented, duplicative, and often conflicting. Sometimes important matters are left unattended because no one has clear authority or the ability to take the lead in addressing the problem. The absence of effective interagency and intergovernmental mechanisms for policy coordination, conflict resolution, and cooperative planning can only further complicate efforts to coordinate the activities of the CNF with other relevant institutions and interests located within the CNF HRU.

Moreover, it is difficult, if not impossible, to bound political lines of influence by arbitrary geographical boundaries. Thus, politically, the "floating boundaries" of the CNF HRU described earlier may extend to the regional and Washington offices of the Forest Service, to the regional and Washington offices of other federal agencies, to the halls of Congress, or to the state capitols in Phoenix and Santa Fe. Because of the proximity of the CNF to Mexico, they may also extend to the Mexican capitol in Mexico City, or to the northern Mexican states of Sonora and Chihuahua. And as stressed before, powerful political interest groups and individuals located outside the CNF HRU--Washington, New York, Seattle--may also be influential participants in agency planning and decision-making. The particular public issue will define the range of governmental actors that will become involved, and whether the loci of decision-making will remain local or whether it will be elevated to regional, national or international levels. The CNF HRU must therefore be viewed as dynamic and fluid, changing as management concerns and public issues are defined and subsequently acted upon. The above catalog therefore represents only an initial guide to understanding the interdependency of the CNF to the institutional framework within which it operates. Such a limited discussion can, however, capture neither the entire range of political actors nor the dynamics of their interactions as they emerge in particular decision-making contexts.

Current Natural Resource Issues in Arizona and New Mexico

The states of Arizona and New Mexico are well-known for their environmental and lifestyle amenities--open space, clean air, sunny climates, numerous recreation areas, and fragile arid ecosystems. Residents of the two states are concerned about the quality of their states' environments, and environmental matters have become increasingly important and salient issues of public policy. Of particular importance are problems concerning water, energy, pollution, and growth (Institute of Government Research, 1976).

Because of the aridity of the area, water has always been a scarce and valued commodity. Historically, some of the most controversial political issues have concerned the allocation and distribution of available water supplies. The waters of the Colorado River have been a focus for many disputes among the seven western states--including Arizona and New Mexico--which are supplied by the river. By most estimates the river's available water supply is already overcommitted; yet new demands for its water continue to be made. Some are concerned that there may not be enough water available to meet current obligations, let alone future demands. They question, for example, whether there are adequate supplies to furnish the Central Arizona Project, which when fully complete will transport Colorado River water to central and southern Arizona, with the water needed to fulfill its promised allotments.

Arizona's groundwater laws have also been a basis for much controversy. Current groundwater laws are so inadequate that in reality no effective management structure for groundwater exists. Depletion of the underground aquifer through overdrafts, and surface subsidence caused by lowering of the

water table--seven feet in some areas of the state--are just two of the problems that have been exacerbated by inadequacies in Arizona's legal and political framework for groundwater management. Revision of the state's basic groundwater law has repeatedly been urged, and several study commissions have specifically been formed to correct legal deficiencies. The current Groundwater Management Study Commission is, for example, the fourth effort since 1937 to attempt such revision (Dunbar, 1977). Whether it can successfully accomplish its mandated tasks--especially in light of the meager accomplishments of its predecessors--remains to be seen, however.

Further complicating the water situation in both Arizona and New Mexico is the emergence of new claimants for the states' limited water supplies. Indian tribes, basing their claims on federal judicial precedents, are claiming increased rights to state waters. They are also asserting that the traditional heavy water users--farmers and ranchers, for example--are infringing upon Indian livelihoods and lands. If various current and future lawsuits over Indian water rights are settled in favor of the tribes, there may need to be a reallocation of existing and new water supplies to comply with the courts' rulings. It is highly unlikely, however, that such reallocations can occur without considerable and intense political controversy.

Increased energy development in the two states is also placing an additional burden on available water supplies. Users who cannot afford to pay as much for water as the energy industry may be forced to reallocate their supplies. For example, irrigated agriculture presently accounts for 87.3 percent of consumptive water use in New Mexico and 91.4 percent in Arizona (Ingram and McCain, 1978, p. 51). Yet since agriculture can least afford to pay an increased cost for water, it is likely to be the most impacted by any reallocations made to provide water for an expanding energy industry.

New Mexico is an energy-rich state. It ranks sixth in oil production, fourth in natural gas production, tenth in coal production and first in uranium production and reserves. It also has a high potential for geothermal and solar production. Yet, New Mexico is one of the poorest states in the nation, ranking 46th in per capita income. While state decision-makers view development of the state's vast energy resources as one way to overcome problems of economic development, they are also concerned that the state not become a resource colony for the rest of the nation (Cortner, 1977). According to the resource colony scenario, local and state resources would be exploited in response to national political pressures and demands. The benefits of energy production would flow out of the state, but the costs, both economically and environmentally, would remain behind.

In contrast to New Mexico, Arizona is an energy-consuming state, importing 85 percent of its energy supplies. However, important coal resources are located within the state on lands controlled by the Navajo and Hopi Indian Tribes. Other valuable mineral and energy resources are also distributed throughout Arizona. Southern Arizona, for example, is heavily mineralized with deposits of copper, gold, silver, lead, zinc, and uranium scattered throughout the area. The extraction and development of these minerals is likely to become more frequent as the nation's energy problems worsen.

While surveys have shown that the residents of Arizona and New Mexico favor more energy development, they have also shown that the residents do not want to suffer the increased air and water pollution such development entails (Ingram and McCain, 1978, p. 55). Yet, as the states of Arizona and New Mexico become further industrialized and their populations continue to grow, the area's air and water pollution problems are also bound to increase. Although smelter activities still remain the most highly visible pollution source in most rural areas, new power plants and manufacturing concerns are already beginning to add significantly to pollution problems in both rural and urban areas. And auto emissions, which are currently a major contributor to pollution in the metropolitan areas of Tucson, Phoenix, and Albuquerque, are also certain to increase as the population increases, further aggravating the growing pollution problem.

Even though residents are concerned about pollution problems, the two states are nevertheless primarily development-oriented. There is concern that pollution regulations, and especially those promulgated by the federal government, may serve to hinder economic development. There is also a general aversion in the two states toward governmental interference and regulation of any kind, an aversion that is coupled with a strong sense and tradition of individualism and a reverence for private property rights. Because of these attitudes and philosophical persuasions, the formulation and implementation of regulatory programs designed to deal with pollution and environmental degradation can usually be expected to encounter difficult political hurdles.

As part of the southern and southwestern "sunbelt" states, the states of Arizona and New Mexico have been experiencing high rates of in-migration, and a concomitant increase in growth-related problems. Not only are there the familiar land use and resource problems associated with rapid growth--leapfrog developments, air and water pollution, congestion, loss of prime agricultural land--but there are also problems created when local communities do not have the financial and administrative infrastructures to deal with an expanding population. Coping with growth-related problems is likely to become an even more challenging task in the future because of the momentum the tax reduction movement has gained. Following California's lead, the state of Arizona, for example, overwhelmingly passed a state constitutional amendment in the 1978 general election which limited state spending to seven percent of personal income. As pressures to cut back on government spending and taxation continue, it will be necessary to scrutinize more thoroughly governmental expenditures at all levels of government. And in the resulting ranking of programs, those dealing with resources and environmental impacts of growth are likely to rank much lower than those programs dealing with essential governmental services such as fire and police protection, national defense, and education.

How the two states of Arizona and New Mexico deal with the problems of water supply, energy development, pollution, and growth in the future could significantly impact the CNF. Reallocations of existing water supplies could change the economic and political structure of the CNF HRU. Farmers and ranchers would no longer be a dominant economic and political force in the region, and grazing activities on the forest would slowly decline.

Alternatively, the search for additional water supplies that would serve all existing, as well as all future users, could increase pressures to implement water yield improvement programs on the forest's watersheds. With increased in-migration more residents could look to nearby forest lands for recreational opportunities and experiences. Overcrowding and overuse could become central management concerns on almost all of the forest's units. The air and water pollution problems associated with industrialization and an expanding population base could also have adverse environmental effects on the forest's water and vegetative resources. And a worsening energy supply situation would no doubt result in increased pressures to open up more and more forest land for mineral and energy resource exploration. Such pressures could even include demands to open those lands previously withdrawn from mineral exploration. In turn, more intensified mineral activity could foreclose or severely constrain opportunities to manage the forest for other resources such as water, recreation, wildlife, and forage. Hence, monitoring the future development of the natural resource policy issues outlined above will be an essential planning and management task if the CNF is to anticipate the impacts that these issues will have upon land uses within the forest, and if it is to act to address those impacts in a timely and innovative manner.

Current Planning Efforts

There are considerable planning efforts in the area of natural resources currently underway in the states of Arizona and New Mexico. Many of these efforts are directly related to the resource policy problems discussed above. Awareness of these planning efforts is important for two reasons. First, the draft planning regulations for national forest land management require coordination with state and local resource plans in order to "enhance the probability that all agencies will adopt the same or compatible objectives" (U.S. Forest Service, 1978, Section, 219.7 [c]). Second, the HRU concept calls for a multi-jurisdictional, issue-oriented approach to planning. Ideally, interested or impacted agencies and groups would join together in a cooperative effort to plan for the problems posed by large-scale developments on, or adjacent to, a national forest. This coordination among agencies would begin before specific plans are worked out. Thus conceived, planning and planning coordination would be proactive rather than reactive, providing agencies with opportunities to deal with problems in a comprehensive manner before decision options are limited and narrowed. If CNF planning efforts are to achieve these objectives, more knowledge of the relationship of state and local resource plans to the CNF is essential. This section briefly examines several planning efforts and indicates how they may impact the CNF HRU.

Water

Several planning activities are ongoing in Arizona and New Mexico in the area of water. Arizona, for example, is preparing a state water plan which is designed to provide the physical and economic information required for comprehensive decision-making concerning water resources management in the

state, many of the studies done in conjunction with plan preparation are providing input into another significant state effort concerning groundwater, the Groundwater Management Study Commission.

Unlike Arizona, New Mexico does not have a state water plan, nor are there any plans to prepare such a document in the near future. However, in 1976, the state did publish a comprehensive water assessment report which described the current status of water resource development and use in the state (Hale, 1978).

Both states have been preparing areawide water quality plans pursuant to Section 208 of the Federal Water Pollution Control Act of 1972. In Arizona, individual 208 plans have been prepared by the six councils of government (COG's), certified by the governor, and sent to the EPA for its approval. The state is also preparing its state guidance document, "State 208 Plan," which will consolidate all the individual plans into one overall document. In New Mexico, the COG's are not preparing 208 plans. Instead, the Water Quality Control Commission is the only designated agency for plan preparation. In turn, it has delegated staff responsibility to the Environmental Improvement Division of the Health and Environment Department, the State Forestry Division of the Natural Resources Department, and the Soil and Water Conservation Division of the Natural Resources Department. Except for a couple of specific pieces, the plan has been completed, approved by the Water Quality Control Commission, and is awaiting EPA approval.

Also worthy of note are the planning efforts of the U.S. Corps of Engineers (COE). As part of the COE's nationwide Urban Study program, which focuses on urban water resource problems, the COE has been conducting Urban Studies in Albuquerque, Phoenix, and Tucson. Finally, in Arizona, the Soil Conservation Service, the Economic Research Service, and the Forest Service, in conjunction with the Arizona Water Commission, have issued a report on water and related resources in the Santa Cruz-San Pedro River Basin of Arizona.

Given the critical water problems the two states are facing, the decision alternatives developed through the water planning efforts described above will inevitably affect both the economic and environmental future of the CNF HRU.

Energy

Both Arizona and New Mexico, aided by the availability of federal funds, have been preparing and implementing energy conservation plans, and organizing energy extension services. Overall, however, New Mexico has been more active in the area of energy planning than has Arizona, perhaps reflecting the fact that New Mexico is an energy-rich state and is anxious to develop its energy resources. The state has just completed its comprehensive state energy plan. The plan builds upon and expands previous planning efforts, which although significant, were more limited in scope. One section of the new plan discusses energy development in the state in relation to the Forest Service's RARE II process.

Transportation in Arizona

The Arizona Department of Transportation has recently completed its transportation planning process and is ready to begin plan implementation. While several planning units are included in the overall multi-modal transportation plan--rail, transit, bikeways, highways, aviation, and some pipelines--the highway unit will probably have the biggest impact on the CNF (McCready, 1978).

In order to establish some priorities for funding and maintenance, the plan has divided the state highway system into two components: a core system and a supplemental system. Roads in the supplemental system are lower on the priority list than those within the core system. Several roads which are classified as supplemental transect or provide access to the CNF. These include: Route 366 to Ft. Grant; Route 266 to Bonita; Route 83 both north and south from Sonoita; Route 289 west from I-19 north of Nogales; and Route 92 south from Sierra Vista. Since the state is likely to be hard-pressed to maintain just its core system, maintenance of roads in the supplemental system will necessarily fall to others (Mickelson, 1978; McCready, 1978). The Forest Service may need to take more responsibility for road maintenance and for improving access to forest lands, areas in which the state has in the past typically assumed much of the responsibility.

The Arizona Urban Lands Task Force

A twenty-five member task force is investigating how the state of Arizona is managing state trust lands in urban areas. A principal charge of the task force is to recommend a process for making decisions that would apply to all lands that fall within the definition of urban lands. As of November 1978, urban lands had been broadly defined to include state trust lands inside boundaries of incorporated jurisdictions, areas which while not developed now will have a substantial impact on urban areas, or areas impacted by urban growth.

Work of the urban lands task force could make it possible for more development to occur on state lands, especially in areas where the Forest Service does not now expect growth or development to occur. While the management history of such lands might indicate that little development will occur in the future, a new process for management could prompt more development (Davis, 1978), requiring the CNF to make a reassessment of supply-demand factors in certain areas.

Growth Management in Arizona

Arizona Governor Bruce Babbitt has stated publicly that he is interested in growth management, but as of now the exact direction which such an approach would take is unclear. Under previous governors, the land use component of the state's HUD 701 (Housing and Urban Development) planning had been geared toward giving direction to a state growth strategy, but it is unknown whether

Babbitt will continue this particular thrust. Growth management is thus currently on the shelf and pending, although it does appear to be a future agenda item. Undoubtedly, what is decided about the state's trust lands will also have a major impact in the area of growth management (Davis, 1978).

Recreation in Arizona

Arizona has prepared its Statewide Comprehensive Outdoor Recreation Plan (SCORP). The eligibility of the state to participate in the federal Land and Water Conservation Fund, which makes federal funds available to state and local governments for outdoor recreation, land acquisition, and facility development, is dependent upon the existence of a comprehensive statewide plan. The Arizona Outdoor Recreation Coordinating Commission is the state agency responsible for plan preparation (Arizona Outdoor Recreation Coordinating Commission, 1978).

The CNF is interested in discovering areas where other state and federal agencies can share responsibility for meeting public demands for forest resources. One such area is recreation. The priorities the state's plan places on the kinds and locations of recreational developments can affect the extent to which the CNF can accomplish this objective.

Air Quality in Arizona

The Arizona Health Services Department recently sent its air quality report, "Identification of Areas Within Arizona that Do or Do Not Meet National Ambient Air Quality Standards" (1978) to EPA (Larson, 1978). In this report, there are several non-attainment areas that include the CNF or are adjacent to it. For example, the Mt. Lemmon area in the Catalina Ranger District is included within an area classified as in non-attainment for sulfur dioxide standards (Section 3.11.4).

When areas on or near the CNF are impacted by air pollution, forest management activities may be necessary to mitigate the adverse impacts on wildlife, vegetation, and water. Moreover, cooperation with the CNF may be required to implement the state's air quality control strategies.

Conclusion

The above catalog is necessarily incomplete. Not all agencies were contacted and fewer contacts were made concerning planning efforts in New Mexico. Planning efforts at the county and city level, which could be no less important to the CNF, were also not included in the discussion. Making a complete inventory of the ongoing planning efforts impacting the CNF HRU would be no small task. Yet, since plans are definitions of current problems and conditions, and indicators of future activities and policy directions, awareness of those efforts must be considered a significant component of a proactive strategy of planning and decision-making.

REFERENCES CITED

- Arizona Health Services Department. 1978. Identification of areas in Arizona that do or do not meet the national ambient air quality standards. Arizona Health Services Department, Phoenix.
- Arizona Outdoor Recreation Coordinating Commission. 1978. Arizona statewide comprehensive outdoor recreation plan, (final draft). Arizona Outdoor Recreation Coordinating Commission, Phoenix.
- Cortner, Hanna J. 1977. Energy policy planning, administration and coordination in the Four Corners states. Consultant's report to the Four Corners Regional Commission. University of Arizona School of Renewable Natural Resources, Tucson.
- Cortner, Hanna J. 1977. Environmental impact assessment and review in energy decision making: State participation in the Lake Powell region. Lake Powell Research Project Bulletin No. 43. University of California Institute of Geophysics and Planetary Physics, Los Angeles.
- Davis, Dennis, Arizona Office of Economic Planning and Development. 1978. Telephone interview, November 14.
- Derthick, Martha. 1974. Between nation and state: Regional organizations of the United States. The Brookings Institution, Washington, D.C.
- Dunbar, Robert G. 1977. The Arizona groundwater controversy at mid-century. *Arizona and the West* 19 (Spring):5-24.
- Fox, Lucy, Environmental Improvement Division of the New Mexico Health and Environment Department. 1978. Telephone interview, December 28.
- Hain, Paul L. 1976. Voters, elections, and political parties. In *New Mexico Government*, F. Chris Garcia and Paul L. Hain, editors. University of New Mexico Press, Albuquerque.
- Hale, David, Water Resources Division, New Mexico Natural Resources Department. 1978. Telephone interview, December 28.
- Ingram, Helen and John R. McCain. 1978. Distributive politics reconsidered--the wisdom of the western water ethic in the contemporary energy context. *Policy Studies Journal* 7 (Autumn):49-58.
- Institute of Government Research. 1976. Arizona speaks. University of Arizona Institute of Government Research, Tucson.
- Larson, Nils, Arizona Health Services Department. 1978. Telephone interview, November 14.
- McCready, Ron, State Planning Section, Arizona Department of Transportation. 1978. Telephone interview, November 14.

Mickelson, Bob, State Planning Section, Arizona Department of Transportation. 1978. Telephone interview, November 16.

Morton, M. L., New Mexico Energy and Minerals Department, 1978. Telephone interview, December 28.

Newsweek. 1978. Single issue politics. XCII (November 6):48-60.

Rich, Jackie, Arizona Office of Economic Planning and Development. 1978. Telephone interview, November 13.

Rourke, Francis E. 1979. Bureaucracy, politics and public policy. Little, Brown and Company, Boston.

Soil Conservation Service, Economic Research Service, Forest Service, in cooperation with the Arizona Water Commission. 1977. Santa Cruz-San Pedro River Basin, Arizona (main report and resource inventory). United States Department of Agriculture, Portland, Oregon.

U.S. Forest Service. 1978. Draft regulations for national forest system land and resource management planning. Federal Register 43 (August 31): 39046-39059.

Woll, Peter. 1977. American bureaucracy, second edition. W. W. Norton, New York.

IV. ISSUE SCENARIOS

FUTURE DEMAND

The demand for CNF resources is a function of the price or total cost of using them, the availability of substitutes, the income or wherewithal people have to utilize the resources, and of course, the users' tastes or preferences. Although a formal economic demand analysis for CNF resources will not be performed here, generalized but realistic statements about future demand can be made based upon information about the functional components of demand. For example, in some cases demand for CNF resources can be imputed from the demand for the resources on a national level, under the assumption that the demand components of income, price, and preferences, etc., are the same for users in Southeast Arizona and the nation. In other cases, while the price components may be assumed consistent for all people, differences in income, and in social characteristics that could influence preferences such as age, education, or employment, can be assessed. Finally, for some situations, expected changes in prices or costs of utilization should be explicitly considered. Importantly, an awareness of changes in certain demographic, social and economic factors can allow resource managers and decision-makers to make informed, rational judgments concerning future demand for CNF resources.

Recent and ongoing research regarding the determinants of natural resource demand suggest significant correlations between rather easily measured characteristics of resource user populations and their preferences for natural resource development and use. The most important of these characteristics are age structure, average income and associated occupation class, amount of education, general lifestyle ranging from rural to urban, and the amount and type of available leisure time.

Generally, people with a rural lifestyle, agricultural occupation and income, and up to twelve years education look to natural resources for extractive, consumptive potential, as these uses are consistent with their lifestyle and available leisure time. Urban residents, earning middle income salaries, engaged in professional and semi-professional occupations with paid vacation benefits tend to prefer amenity values and non-consumptive uses of natural resource land. Skilled and semi-skilled workers with modest levels of formal education, low to middle income levels, and urban or suburban lifestyles often prefer family-oriented, developed recreation use of natural resource lands, as well as some extractive uses such as hunting and fishing. Two social groups having relatively large blocks of leisure time, but who differ importantly in other ways are college-age students and retired people. The latter can be expected to prefer highly developed, high technology recreation opportunities with relatively low physical requirements. Students, on the other hand, usually prefer opportunities for more intense physical expression requiring low dollar expenditure.

Certainly, it is not difficult to find exceptions to the general behavior patterns drawn above; nonetheless these patterns are useful and viable for broad land management planning of natural resources. A note of caution is

warranted, however, regarding two aspects of the demand function. In the preceding discussion, potential resource users were roughly cast into two types, those preferring extractive, consumptive uses of resources, and those who consider amenity and recreation values to be most important. In reality, no mutually exclusive types occur since all responsible citizens expect good water, wood products, and food supplies to be produced on public lands. This leads to the second aspect of demand which must be accounted for, prices or costs of resource use. Changes in market determined prices for wood products and red meat reflect the nature of demand relative to supply. A sustained higher price level for a relatively common natural resource product suggests very high demand, and vice-versa. Many natural resource products have no market determined price but the costs of utilizing the resources have important effects on the demand for such uses. The availability of substitute resources or resource uses must always be considered if the costs of utilizing a given resource escalate.

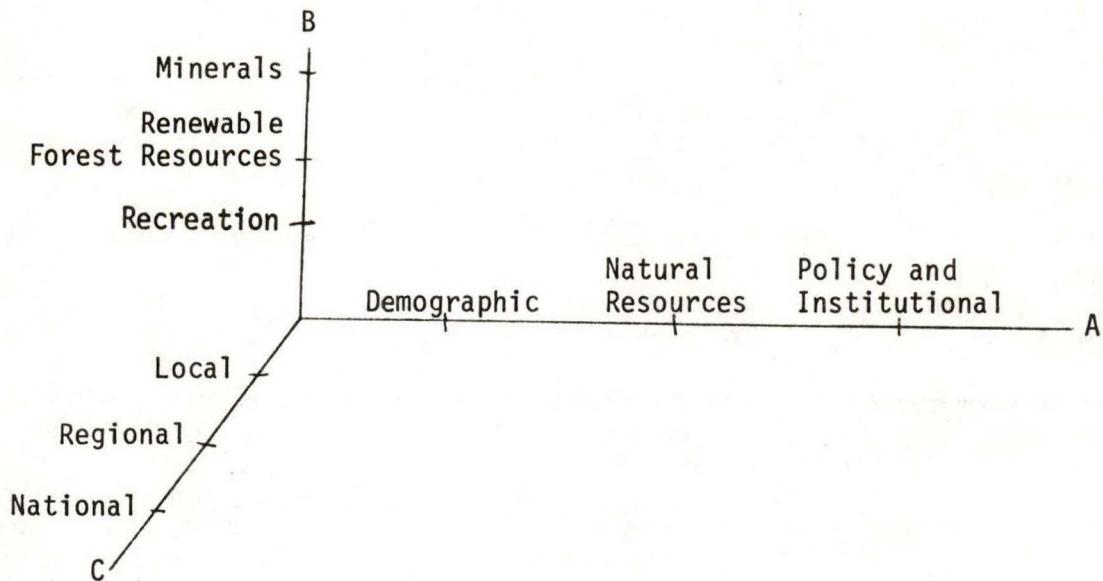
Two factors affecting demand that have been discussed only peripherally at this point are income and population. Relatively high levels of disposable family income tend to broaden people's consumption patterns, both for the current product mix and for new products and uses. Population increases, other things remaining equal, will result in increased demand. Population and relative income levels serve as driving forces behind demands for natural resources and should be monitored by decision-makers.

In summary, planning and management for natural resources on the CNF should be done with clear knowledge of certain key components of demand. For the most part, prices and costs of resource use will be nationally determined and, therefore, beyond the influence of resource changes on the CNF. On the other hand, population, income, and elements of people's preference will vary locally and should be carefully observed.

As an example of how rational statements can be made about possible future demands for CNF resources, a series of issue scenarios were prepared using information on the variables or characteristics discussed above. In the following section the structure and composition of these scenarios is discussed. It will be apparent that issue scenarios are hypothetical statements about the future that involve all relevant aspects of the social and physical environment, of which resource demand is only a part. However, a sense of demand for resource uses is necessary in order to relate that to the other parts of the environment in forming a scenario.

STRUCTURE OF SCENARIOS

Building issue scenarios, or alternative futures as they are sometimes called, is an exercise whereby past trends, current conditions and educated guesses about future events can be brought together to provide a best estimate as to what may lie ahead. As we look to the future for the CNF the following graph can be used as a means of delineating what is to be explored:



On axis A are three general topic areas. Demographic includes social, economic and demographic characteristics; natural resources include energy, water, minerals, grazing and timber; and policy and institutional include laws, regulations, and institutional arrangements. Axis B, the axis for the CNF, is broken into three available forest resources: minerals, renewable forest resources and recreation. These three resources are the focus of attention for the issue scenarios since they are what will be impacted. Axis C provides the scope of what will be impacted and from whence the impacts will be generated, local (forest district), regional (the entire CNF and 7 counties in two states), and national (the nation).

The graph is only a rough guide and many of the topics that could be generated from the three dimensional intersection of the lines will not be included in scenarios. This is the case because data are not available or because there is no anticipated issue.

Each scenario will be confined to one page and deal with only two or three variables. Hence, they will be very simplistic and will greatly simplify reality. The reader will be left with the task of integrating the scenario results into a coherent whole that fits his/her conception of reality.

Scenario : One

Topic Area : Energy

Sub-Topic : Gasoline price increases

At Issue : The impact of higher prices on CNF visitor days.

Anticipated Changes : For the total CNF, visitor days will not be affected. If there is a change, it will be in the direction of an increase in visitor days.

Reasons : (A) Expenditures for gasoline amount to only a small portion of the total family budget. The average American family spends 3 percent of its annual income on gasoline. The range is 4 percent for families with annual incomes averaging \$3,500, to 1 percent for families with annual incomes averaging \$38,500.* As a consequence the price of gasoline will have little impact on traveling to forest recreation sites.

(B) To the extent that people try to offset the increased gasoline prices by saving through substituting less expensive forms of recreation, visitor days will increase.

(C) Some vacationers may choose to camp out in order to reduce vacation costs as opposed to utilizing motels.

Implications for the CNF : (A) More day visitor sites will be needed.

* Source: U.S. Department of Labor. 1976. 1973 consumer expenditure survey. U.S. Government Printing Office, Washington, D.C.

Scenario : Two

Topic Area : Policy and Institutional

Sub-Topic : Policy regarding the continued opening of forest lands for the search for gas, oil and mineral resources.

At Issue : The impact of opening these lands and keeping them under Forest Service management as opposed to allowing private ownership.

Anticipated Change : More lands will be opened and may remain under Forest Service management.

Reasons : (A) Rising prices of oil and gas and increased national dependency on foreign resources will foster greater pressure to "mine" Forest Service lands.
(B) Increased pressure from business and the public to have less expensive gas, oil and minerals will necessitate increased exploration on the national forests.

Implications for the CNF : Greater management responsibility with emphasis on reclamation of forest lands.

Scenario : Three

Topic Area : Natural Resources

Sub-Topic : Water rights, watershed, population increase and industrialization.

At Issue : Water from CNF watershed.

Anticipated Change : Greater demand for water run-off from the CNF.

Reasons : (A) Increased population use
(B) Increased industrial use
(C) The potential for Indian nations to receive large water allotments through litigation.

Implications for the CNF : The need to use management practices that will increase water harvest from the CNF. These practices may conflict with, or adversely affect grazing, timber harvest, recreation or wildlife habitats.

Scenario : Four

Topic Area : Energy

Sub-Topic : Gasoline shortages and threats of shortages.

At Issue : The impact of shortages or threats of shortages on CNF CNF recreation visitor days.

Anticipated Changes : For the total CNF, visitor days will decline. The largest decline will be in visitor days from vacationers.

Reasons : (A) Vacationers will postpone or cancel their trips due to the uncertainty of being able to acquire gasoline.

(B) Day visitors will forego a trip to the forest since gasoline is difficult to acquire.

Implications for the CNF : Additional picnic and camping sites will not be required.

Scenario : Five

Topic Area : Demographic

Sub-Topic : Age composition

At Issue : The impact of changing age structure on types of recreation demand.

Anticipated Changes : An increase in family-oriented types of recreation as well as an increase in recreation engaged in by retirees.

Reasons : (A) There has been a disproportionate increase in the number of people in the 18-44 age bracket in the past 10 years. This is the age bracket that has a predominance of families with children.*

(B) Over the past 10 years there has not been a change in the proportion of people age 65 plus.* However, this may change due to the attractive nature of the climate of the area and the increasing affluence of retirees.

Implications for the CNF : There will be greater demands for both developed and dispersed recreation, but the emphasis will be toward development.

* Source: U.S. Bureau of the Census, Current Population Reports.

Scenario : Six

Topic Area : Demographic

Sub-Topic : Income and population changes

At Issue : The impact of increased income and population on the number of recreation user days and types of recreation demanded.

Anticipated Changes : There will be an increase in high technology recreation (off road vehicles, etc.) and an increase in recreation user days in general.

Reasons : (A) Incomes of people in the employed age bracket (18-65) have increased in the past 10 years.*
(B) There has been a sizable increase in the number of people in general in the past 10 years.
(C) As incomes increase the demand for more expensive recreation devices increases (off road vehicles, for example).

Implications for the CNF : More land area devoted to off road vehicle use and more area devoted to family-oriented activity.

* Source: Edwin H. Carpenter, "The potential for population dispersal: A closer look at residential locational reference," Rural Sociology, Vol.42:3 (Fall, 1977).

Scenario : Seven

Topic Area : Demographic

Sub-Topic : Population increase and associated congestion that does or will occur in some districts? Who will these people be?

Anticipated Change : There will be increased demands by middle income people age 18-44 in districts that are currently under-utilized. Other people, predominantly high income, will stop participating.

Reasons : (A) Lower income people are not as bothered by congestion.*
(B) Higher income people value their time too highly to travel greater distances to other sites.*

Implications for the CNF : Districts that provide recreation opportunities similar to those of the congested districts will see an increase in demand.

* Source: Judgmental estimate based on economic principles applied to similar contexts.

Scenario : Eight

Topic Area : Demographic

Sub-Topic : Recession (that may last 2 years)

At Issue : The impact of a recession on recreation visitor days.

Anticipated Change : Visitor days will increase for recreation involving low technology equipment (equipment other than off road vehicles, for example).

Reasons : People will substitute low priced recreation for high priced recreation following recessionary impact on disposable income.

Implications for the CNF : Be prepared for a temporary increase in demand for low technology recreation.

Scenario : Nine

Topic Area : Policy and Institutional

Sub-Topic : Litigation and the Forest Service

At Issue : The amount of litigation in the future if there is an economic recession.

Anticipated Change : If there is a recession, then litigation initiated by not well-established environmental groups will diminish. However, well-established groups with financial reserves will likely see the need to initiate more litigation.

Reasons : (A) Environmental groups that are not well-established will lose their financial support from segments of the general public and disband.
(B) Well-established environmental groups that have sufficient financial reserves will see a need to initiate more litigation as public pressure mounts to extract more coal and relax environmental protection laws.

Implications for the CNF : Since in the aggregate it is not clear what the total number of litigations will be, implications are not appropriate. More data are needed.

Scenario : Ten

Topic Area : Demographic

Sub-Topic : Population and income change by county

At Issue : The impact of population and income increase on recreation demand by forest district.

Anticipated Change : Catalina and Safford Ranger districts will see the greatest increase in demand.

Reasons : (A) Ninety percent of the growth of the past 10 years for the southeastern counties was in Pima and Pinal counties.
(B) Pima and Pinal are the fastest growing counties in population and family income.

Implications for the CNF : Disproportionate increase in family oriented and high technology recreation in the Safford and Catalina Ranger Districts.

V. SUMMARY AND ANALYSIS OF DISCUSSIONS WITH CNF DISTRICT RANGERS

OBJECTIVES OF THE DISCUSSIONS

In November 1978, members of the UA socioeconomic technical work group held individual discussions with the forest supervisor and the district rangers of the Coronado National Forest (CNF).* The discussions had three objectives. First, we wanted to obtain information about the current socioeconomic and political situation in each district. Our assumption was that the district rangers could themselves provide useful information about important management concerns and public issues likely to affect future CNF policy and programs. Moreover, the discussions would directly involve the district rangers in the development of socioeconomic-political information for the comprehensive land use plan. They would represent another ranger contribution to the particular planning process adopted by the CNF; a process which calls for participation by the district rangers and their staffs throughout the entire planning process. Such participation and information, we felt, would supplement other contributions by the UA socioeconomic technical work group and information solicited through the public involvement program.

Our second objective reflected a mandate to develop a methodology for using socioeconomic-political information and integrating it into forest land use planning and decision-making. We felt that an initial step in devising such a methodology would be to obtain the district rangers' assessments of the socioeconomic-political information they currently receive and their opinions about the kinds of socioeconomic-political information they would like to receive.

Our final objective was to examine how district rangers in the CNF manage the political aspects of their job. By exploring the linkage between the better use of socioeconomic-political information and ranger acquisition of the political skills needed for gathering and evaluating that information, we hoped to understand better the political skills and capabilities of the district rangers.

The District Ranger as Politician

Forest management is not merely a caretaking job for professionally trained scientists; it also involves choosing between competing demands for use of the forest. Forest managers must deal not only with technical questions of land use, but also with value-laden political questions of who gets what, when and how. Difficulties abound when forest managers feel a

*Henceforth, the forest supervisor is also referred to as a district ranger.

professional need to stand above all politics and therefore try to transform political decisions into technical decisions.

Richard Behan argues that the fact that resource management at all administrative levels is engulfed in politics should not be lamented; rather it should be considered a "challenge...to do a better political job of handling the resources" (Behan, 1972). He recommends that the forest manager develop the skills of the "para-politician," by becoming more attuned to the political aspects of resource decision-making. Essentially the skills of the para-politician involve the ability both to lead and follow public opinion at the appropriate times, and the ability to achieve workable compromises among divergent views by seeking programmatic and often only partial solutions. By simultaneously and selectively leading groups toward pragmatic compromises and reaching decisions on the basis of a consensus, Behan concludes, the forest manager will be able to avoid public conflict and personal frustration.

Development of these skills must be premised on a correct understanding of the concepts of "public opinion" and "public interest". First, effective Forest Service para-politicians, Behan cautions, must guard against restricting their understanding of public opinion to those opinions based on facts to the exclusion of those opinions which may be based on prejudices, beliefs, or some other non-rational basis. Second, para-politicians must not exclude the short-term in favor of the long-term in determining what is in the public interest. Third, the "public interest" must not be perceived as knowable in some absolute sense. Rather, it must be seen as "served by anything two conflicting minorities can agree upon". Finally, and most importantly, defining "the public opinion and the public interest as if they were some singular, monolithic things" must be avoided.

Because of their location at the grass-roots level of forest land management, district rangers have a number of opportunities to develop their skills as para-politicians. A number of studies (Kaufman, 1960; Robinson, 1975; Reich, 1962) have portrayed district rangers as being heavily involved in a variety of civic, social and professional groups. Forest rangers are characterized as leaders of their respective communities, leaders who are usually invited to join in a number of community and local organizations. These activities, it is maintained, help the rangers build local support for the agency and provide many informal opportunities to discuss agency plans and policies. Important political cues are obtained through interactions with other community leaders--businessmen, bankers, government officials--which can help the rangers determine the local political climate and to assess the political feasibility of the actions they want to take.

In many respects the objectives of our discussions with the CNF district rangers can be understood as aimed toward determining whether or not the rangers fit the description of a typical district ranger as a community leader, and whether or not available opportunities to acquire and use the skills of Behan's para-politician are being exploited. Consequently, a significant portion of our discussions with the rangers focused on the relationships they have with important community and constituency groups and on the decision-making resources and strategies they use to gain support for their decisions.

The Discussion Format

In order to organize the discussions with the rangers in a meaningful way, and yet achieve our three objectives, discussion items were grouped into four general discussion topics. These topics included: current and future management situations on the districts; relationships with outside community and important constituency groups; needs for socioeconomic-political information; and decision-making patterns and strategies. (A complete list of the items included within each discussion topic is appended to this chapter.) A summary and analysis of the discussions in each of these four areas follow.

DISCUSSION SUMMARIES AND ANALYSES

Current and Future Management Situations

There are a number of issues that are of common concern across the entire CNF. Necessarily, the particular form of each issue as expressed by the districts in our individual discussions differed somewhat; however, there were enough similarities to make some generalizations about these issues possible. The issues include: grazing, wilderness and special use designations, land acquisition and exchange, fuelwood harvesting, and mining.

Grazing

Except for the Santa Catalina district, grazing is a central management activity on the CNF. The influence of the grazing permittees is well-acknowledged, and each district strives to maintain amicable working relationships with its permittees. While it was generally felt that the CNF has had fewer problems with grazing permittees than other national forests, the grazing situation was nonetheless a critical issue for most CNF districts.

The Douglas district reported a serious problem with poor range conditions and overgrazing, and noted that district efforts to improve range conditions through reductions in use would no doubt result in a series of appeals from the ranchers. In most districts, such reductions in use and penalties levied against permit violators can cause considerable bitterness and resentment. To forestall or mitigate these ill-feelings, the districts work with affected ranchers on a one-to-one basis.

Ranchers are also likely to oppose agency actions when they feel those actions will damage grazing allotments or result in an eventual reduction of available forage land. District ranchers, for example, actively and vocally opposed RARE II, arguing that Forest Service recommendations for more wilderness could eliminate or severely constrain grazing activities. Also, ranchers who feared damage to their allotments joined with a local environmental group to oppose the issuance of a permit for motorcycle races on the

South Huachucas. Thus, on most issues in the CNF which involve reallocations of land uses to meet new or changing demands, the grazing permittees are likely to emerge as significant participants.

Wilderness and Special Use Designations

Pressures to close certain lands to development and to designate those areas as wilderness are generating considerable controversy in the CNF districts. As mentioned above, traditional forest users, such as ranchers and miners, are concerned that closure will be detrimental to their interests and livelihoods. They have, for example, been quite firm in their opposition to the RARE II process. On the other hand, environmental and preservation groups are pressing hard for more closures and wilderness designations, even though several of the areas favored by those groups ranked low according to RARE II criteria. If some of those areas are not designated as wilderness, more controversy is certain.

Related to the wilderness issue is the pressure to limit development in areas where there are unique natural or visual resources, rare or endangered species, critical habitats, or special historic and cultural resources. Demands for protection of these critical and unique resources are likely to intensify, generating further conflicts in the districts between preservationists and traditional user groups. An immediate pressing issue of this nature concerns Cave Creek. There is world-wide interest in designating this area a national zoological area or a wildlife management area. But such eventualities have aroused the concern of several local interests. Grazing permittees fear losing their allotments, summerhome owners and local hunters fear road closures which would limit access, and some local residents want to see additional recreational development in the area. While the land management plan is expected to address the Cave Creek issue, any proposed alternative will no doubt generate further controversy, and possibly, litigation.

Land Acquisition and Exchange

Another frequently mentioned management concern was private lands within or adjacent to the forest. Use of these lands creates resource problems, such as water pollution, fire hazard, and erosion, which subsequently impact the forest. To mitigate these problems, land exchange or acquisition are often the preferred management options. Deciding which particular course of action (acquisition or exchange) to take in an area and negotiating agreeable terms can become controversial. Participants in such issues include not only the private land owner, but also other groups which are seeking to advance or protect their specific interests in the land under consideration.

Fuelwood Harvesting

Rising energy costs have created increased demands for the forest's fuelwood supply. Within the districts there is recognition that more monitoring and regulation of this activity may be necessary. On the Douglas district, the fuelwood situation is further complicated by the fact that much

of the demand comes from Mexico. In the future the Mexican citizen's real need for the fuel may need to be weighed against a growing local resentment over the export of the area's resources to another country.

Mining

Because of national mining laws, the Forest Service has little control over mining activities on forest lands. While the districts reported good cooperative relations with mining companies during exploration, they also noted that complete plans for mineral production are often not revealed to them. Because it is in these latter stages of mineral development that most controversies arise, the timing, scale, and environmental impacts of possible mining activities remain important issues of concern.

Other Issues

While the above issues were the most frequently mentioned during our discussions with the rangers, they were not the only issues of concern, nor necessarily the most important. Other issues included: resolution of water pollution problems; potential demands for more public access to forest lands; possible pressure to increase water yield from the forest watershed; potential regulation of research activities and professional guided tours; future regulation of dispersed recreational use through restrictive capacity management; reemergence of the Swift Trail road issue if renewed efforts are made by project sponsors to continue work on the road; termination of summerhome leases, and the actual removal of the homes from the forest in the next 6 to 10 years; and finally, in the near future, initiation of the next step in the closure of the Sabino Canyon Recreation Area to vehicular traffic.

Conclusion

While the district rangers were well-informed about the major issues presently confronting the CNF, they felt less certain about their abilities to resolve some of them at the district level or to foresee the emergence of future controversies. Understandably, the rangers felt confident about their abilities to comprehend issues and properly resolve them from the perspective of protecting and rationally managing forest resources, but felt much less certain how to deal with issues from the less rational perspective of the politician. To some, this deficiency was regarded as regrettable. To others, adopting the role of a political actor was regarded as inherently distasteful or in conflict with their concept of professionalism. This latter attitude is understandable, for the land manager's chief concern must be with protecting forest resources, while the politician's chief concern is with protecting the interests of a constituency and thereby securing support for himself or herself. But, with the increasing social complexity of today's world, land managers must increase their sensitivity to the basic political questions of who gets what, when, how, and why if their success as professional foresters is to be maintained.

Relationships with the Outside Community and with
Important Constituency Groups

There was general acknowledgment that special interest groups play an important and influential role in district decision-making. Whether particular groups were generally seen as supportive or opposing depended on the individual management situation in the district. For example, in the Santa Catalina district, where recreation is the dominant use, preservation and environmental groups were considered a predominant support constituency. On the other hand, in districts such as Nogales, where activities such as grazing are dominant, closer and better relationships were described with that user group than with environmental groups. Some districts perceived environmental groups as the most likely to take their case to a higher level and to work around the districts to achieve their objectives. For example, the Sierra Club is frequently involved in issues concerning management of the CNF. Yet, two districts indicated that the club had never made an effort to contact them; they knew no club members.

The rangers frequently named key contacts within those groups that do work closely and directly with the districts, and every ranger repeatedly stressed the importance of the one-to-one working relationship. Nevertheless, such contacts with influential constituency and community groups come mainly in an official capacity. For the most part, active ranger membership in a wide variety of civic, social and professional groups is far more limited than past studies have implied. Thus, not all rangers in the CNF fit the description of the typical forest ranger as a community leader who works informally as well as formally to gain support for the agency and its policies.

The rangers seemed able to sense and evaluate their own abilities to deal with constituency and community groups. Some felt pretty secure in their relationships. Others felt less so, and acknowledged the need to devote more time to building support and linkages among influential groups and individuals within their district.

The district rangers have little direct and ongoing involvement with the planning efforts of state and local governments. While most of the districts did mention working from time to time with local planning and zoning bodies on specific issues requiring decision, there was only minimal awareness of ongoing, functional comprehensive planning efforts in the areas of water, energy, land, and transportation. Two districts were skeptical of the accomplishments of such planning efforts. Two other districts, however, expressed a desire to become more aware of these planning activities and to improve coordination with state and local agencies.

The rangers also had different evaluations of their own participation in the development of the land management plan for the CNF. Attitudes varied from those who felt that the plan would assist the forest in placing different emphasis on uses across the forest, enabling a forest-wide approach to meeting demand, to those who felt that fulfillment of the legal requirement to prepare the plan would not significantly change the way the districts

operated. Some expected the plan to head off or settle some emotional political issues, while others thought the plan could make their jobs harder. Almost all wanted to ensure that the plan not limit their decision-making discretion.

Conclusion

The CNF is interested in exploring planning approaches which call for coordination and cooperation among agencies and groups that will be impacted by resource reallocations or by significant socioeconomic changes in an area. In such instances, the CNF and other impacted interests would ideally come together as members of the community, identify issues, determine areas of responsibility, and work out specific solutions. Adoption of such planning approaches by the CNF would, however, require CNF districts to develop a greater awareness of both the programs and planning activities of other agencies. More effort would be required in the area of cooperative planning; districts would need to work directly with both state and local officials and elected representatives. All rangers would need either to develop or improve upon their skills as community members and leaders.

Needs for Socioeconomic and Political Information

Three significant findings emerged in our discussions with the districts concerning their needs for socioeconomic and political information. First, the districts were highly critical of the kinds of socioeconomic information they currently receive. Not surprisingly, many of the criticisms offered were similar to those appearing in the professional literature which has examined the state-of-the-art of social impact assessment: information is sketchy; there is little solid data or sampling to back up conclusions; and it is consequently difficult to test the validity of those conclusions. Second, the majority of the districts were uncertain or unaware of how the CNF is economically tied to its surrounding communities. They did not see how most socioeconomic information about those communities is useful for district decision-making. Finally, the districts readily admitted their inability in dealing with the socioeconomic information that is available. Acknowledging that personnel have not had much previous exposure and training in socioeconomic and policy analyses, several stressed the need to begin with basics. "If we can't understand what is presented to us," said one district, "how can we in turn explain it to [forest user groups]?"

The district rangers had several suggestions about the kinds of socioeconomic information that they would like to have available and have the abilities to deal with. By far the most repeated request was for information that would help the forest better respond to demand. The rangers want answers to such questions as the following: Where do demands come from? When and from where will the next big push come? Why do people come, i.e., what are the needs of people that lead them to look to the forest for satisfaction of those needs? Alternatively, why don't people use the forest? Are there needs that the forest is not meeting, but which it could be capable of

supplying? The rangers also mentioned the need to develop the ability to judge the socioeconomic impacts of forest decisions. For example, what would be the impact if grazing were eliminated from certain areas? What would be the impact if a large mining operation began on or near the forest? Two districts mentioned that information to help them predict the reactions of constituency groups and the public to proposed agency action would be a helpful tool.

Conclusion

While the potential for addressing several of the information needs cited by the rangers does exist, it is apparent from our discussions that formalistic methods and approaches to do so will be the least useful. A major challenge for those working with the districts in the area of social impact assessment will be to translate socioeconomic and political information so that it can be understood and applied by those unaccustomed to the methodologies and jargon of the social sciences.

Decision-Making Strategies and Patterns

From our discussions it was clear that district rangers in the CNF do consider political factors when making decisions. The rangers frequently described instances in which they made judgments as to whether the political climate was right for taking action. Receiving their cues from those who would be affected by their decision, they decided in some instances to back off until they could gather more support for their preferred course of action. In other instances, they decided to go slowly in implementing a decision, hoping to minimize the magnitude of the expected opposition.

The district rangers were also aware, albeit implicitly, of the decision-making resources they have for building support for their decisions. The expertise of the Forest Service was generally seen by the rangers as an important asset and they felt support could usually be maintained for those decisions reflecting the best available scientific information. Also, every ranger emphasized the importance of the one-to-one relationship as a strategy for maintaining support and cooperation and for minimizing the opposition of potential adversaries. Some rangers specifically noted the trouble the districts could incur if they did not do a complete job of keeping influential user groups informed of agency decisions, or if they took action without forewarning those groups. Others mentioned the importance of cultivating good relations with the media and using the media to get their message delivered in a favorable manner. There was, however, variation in the extent to which the rangers felt they should actively mobilize constituency groups to support their decisions when faced with opposition from other groups. Some felt that such a strategy could be dangerous, resulting in a general loss of public input. Others felt that it was to the advantage of the districts to seek the support of groups which would back up agency decisions in the face of threatened opposition.

Conclusion

There are rangers on the CNF who are developing the skills of Behan's para-politician. There are others who exhibit some discomfort with this aspect of the job. Our discussions with the rangers demonstrated that they are at a good vantage point for judging what projects and actions will arouse opposition, and what current undertakings are likely to conflict with possible future developments. The rangers who are developing the skills of the para-politician are more likely to recognize and use effectively their political opportunities and resources. They encounter, we posit, fewer difficulties coping with the political ramifications of the decisions they have to make than those rangers who think they are, or should be, above politics.

REFERENCES CITED

- Behan, R. W. 1972. Para-politics and natural resource administration, or, what to do while waiting for the Sierra Club to arrive. Paper presented to the U.S. Forest Service Tri-Forest Conference on Organizational Improvement, Boise, Idaho.
- Kaufman, Herbert. 1960. The forest ranger: A study in administrative behavior. Johns Hopkins Press for Resources for the Future, Baltimore, Maryland.
- Reich, Charles A. 1962. Bureaucracy and the forests. Center for the Study of Democratic Institutions, Santa Barbara.
- Robinson, Glen O. 1975. The Forest Service: A study in public land management. Johns Hopkins Press for Resources for the Future, Baltimore, Maryland.

DISCUSSION TOPICSA. Current and Future Management Situation on the District

- Describe the most pressing issues in your district today.
- What are the most troublesome problems and issues you see coming down the road? in the next year? in the next ten years?
- How do you think the CNF will look in twenty years? How would you like it to look?

B. Relationships with the Outside Community and with Important Constituency Groups

- What are the most important and influential political and economic groups in your community, and what kinds of regular or non-regular contacts do you have with these groups?
- How well acquainted are you with constituency groups, i.e., permittees, miners, recreational groups?
- For new rangers on the CNF: How do you intend to go about finding out about the important and influential political and economic groups in the community? What kinds of contacts with community leaders and constituency groups have you been making since your arrival?
- To what extent are you involved with the planning efforts of others in the private or public sectors? With what subjects are these planning efforts concerned: air, water, recreation, economic development?
- In a given month, what are the kinds of meetings you attend? in your official capacity? in your personal capacity? What are the professional, civic, and social groups in which you have a membership?

C. Needs at the District Level for Socioeconomic and Political Information

- If time and money were no obstacles, what kinds of socioeconomic and political information about the community in which you work would you like to have?
- What are your major criticisms of the socioeconomic information currently presented in documents such as environmental impact statements? When do you find that such documents have useful information?
- How do you think we could make socioeconomic-political analyses more helpful to you?

D. Decision-Making Patterns and Strategies at the District Level

- In general, on controversial issues, what kinds of decision-making resources and capabilities do you have for building support for your actions, i.e., what means can you use to influence the acceptance of your decisions? How do your decision-making resources and capabilities compare with the resources and capabilities of those who oppose your actions?
- How often and on what kinds of decisions have you had to back off in the past? Why?
- On what kinds of issues are groups in your district likely to appeal your decisions to a higher level in the Forest Service, to congressional representatives? What kinds of groups, if any, regularly challenge your decisions?
- We would also like to talk with you about some specific controversies that have occurred on your district, how they emerged, why they occurred, and how decisions were made in handling those problems. How did you, for example, evaluate the political ramifications of the decisions you had to make? What factors entered into your mind as you made decisions that you anticipated would be controversial?

VI. EVALUATING ALTERNATIVE USES OF FOREST RESOURCES: A SUGGESTED UTILIZATION METHODOLOGY FOR INTEGRATING SOCIOECONOMIC-POLITICAL INFORMATION INTO PLANNING AND DECISION-MAKING

INTRODUCTION

The demand for both the extractive and recreational resources of U.S. forest lands has increased dramatically over the past decade. Intensified and frequently conflicting demands for limited forest resources can reasonably be expected to characterize coming years, especially as population and income levels, as well as concern over conservation and environmental considerations, continue to grow.

Simultaneously, Congress has mandated that explicit account of the net benefits which result from the use of forest resources become an integral part of allocative decision-making. This call for increased accountability necessitates the adoption of a comprehensive methodology for evaluating allocation proposals, a methodology that can provide a basis for resource decision-making that is both explicit and justifiable. In particular, when alternative proposals for the use of forest resources would not result in irreversible damage to the resource base itself, an objective procedure is required to decide how the resources in a given area are to be used and at what intensity of use.

In the following sections it is argued that allocative decision-making by forest personnel should attempt to maximize the social efficiency of forest resource use within the context of political realities. Social efficiency of forest resource use requires the optimal balancing of allocative efficiency considerations (i.e. maximizing the net benefits of resource use) and distributive equity considerations (i.e. concern over the fairness attributable to the distribution of benefits and costs resulting from resource use). In a given area, the activity that results in the highest level of social efficiency is preferable to all alternative proposals for resource use. Thus, decision-makers should evaluate the social efficiency of politically feasible alternatives, and then select the management proposal that optimally balances the allocative efficiency and distributive equity associated with forest use.

The following three sections briefly describe the three evaluation components of this preliminary utilization methodology: allocative efficiency, distributive equity, and political feasibility.

ALLOCATIVE EFFICIENCY

Resources are allocated efficiently when the net benefits (i.e. benefits minus costs) resulting from the use of the resources are maximized (this is the basic purpose of a benefit-cost analysis). A simple example can help illustrate the fundamental concepts. Suppose that the demand for developed recreation has increased in a region due to increasing population. In response to this change the forest decision-maker wants to determine how many additional acres of forest land should be allocated to this use. Figure VI-1 illustrates how an efficient allocation of acreage would be determined.

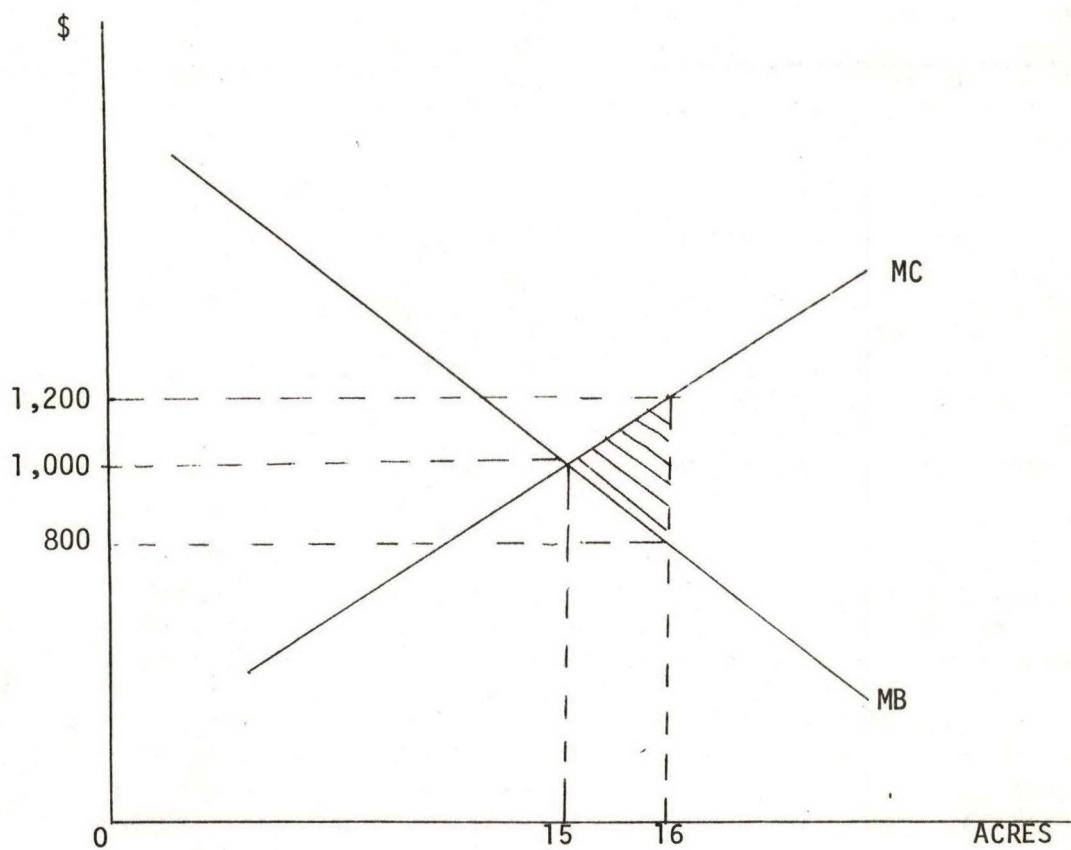


Figure VI-1: Efficient Allocation of Forest Acreage

The line MB is the marginal benefit schedule and shows the addition to total benefits that would result as one more unit of land is allocated to developed recreation in this region. For example, if a 16th acre was allocated to this use, \$800 would be added to the total benefits associated with this activity. The line MC is the marginal cost schedule and shows the addition to total costs that would result as one more unit of land is allocated to developed recreation in this region. If a 16th acre was allocated to this use in this example, \$1,200 would be added to the total costs associated with this activity.

Net benefits are maximized when $MB=MC=\$1,000$ with 15 acres being allocated for developed recreation purposes. Less acreage than this is inefficient since the addition to total benefits (MB) exceeds the addition to total cost (MC) at levels less than 15 acres. In this example, net benefits would decline by the amount of the shaded triangle if 16 acres are set aside for developed recreation instead of the efficient level of 15 acres.

In general, resources will be allocated efficiently when a level of use is selected such that $MB = MC$. This use level will necessarily maximize the net benefits associated with the use of the resources for a particular purpose. Forest decision-makers, then, require empirical information on the MB and MC schedules of alternative uses of forest lands to be able to identify the efficient level of use for an activity, and to compare total net benefits of alternative activities.²

DISTRIBUTIVE EQUITY

Allocative efficiency is concerned with the maximization of net benefits resulting from resource use regardless of who actually receives the benefits or bears the costs. That is, the incidence or distribution of benefits and costs is not considered in determining an efficient level of resource use. Allocating resources strictly on efficiency grounds is implicitly based on two value judgments: 1) that individuals' preferences shall count, and 2) that these preferences shall be weighted by market power (e.g. willingness to pay). When alternative value judgments are substituted for these on ethical grounds, different resource use recommendations result.

Distributive equity considerations focus primarily on alternative ethical interpretations of the second value judgment. For example, the phrases "individual need" or "individual merit" might be appropriately substituted for the phrase "market power" in this value judgment, depending on the context in which the decision-maker must operate.

The allocative significance of these substitutions can be illustrated in Figure VI-2. Returning to the developed recreation example, allocative efficiency would require that 15 acres be set aside for this purpose since this level of use equates MB and MC. Now suppose that the people who will benefit from this activity are predominantly lower income while the costs will be borne by average federal income taxpayers. If value judgment two is changed to read "these preferences shall be weighted by individual need," then the effect would be to weight the MB schedule more heavily. In Figure VI-2 this is illustrated by MB shifting to MB' so that 16 acres should be set aside for developed recreation in this region. Compared to strict efficiency recommendations there is still a loss of net benefits given by the shaded triangle. The argument given in this example maintains that this efficiency cost (i.e. loss in net benefits)

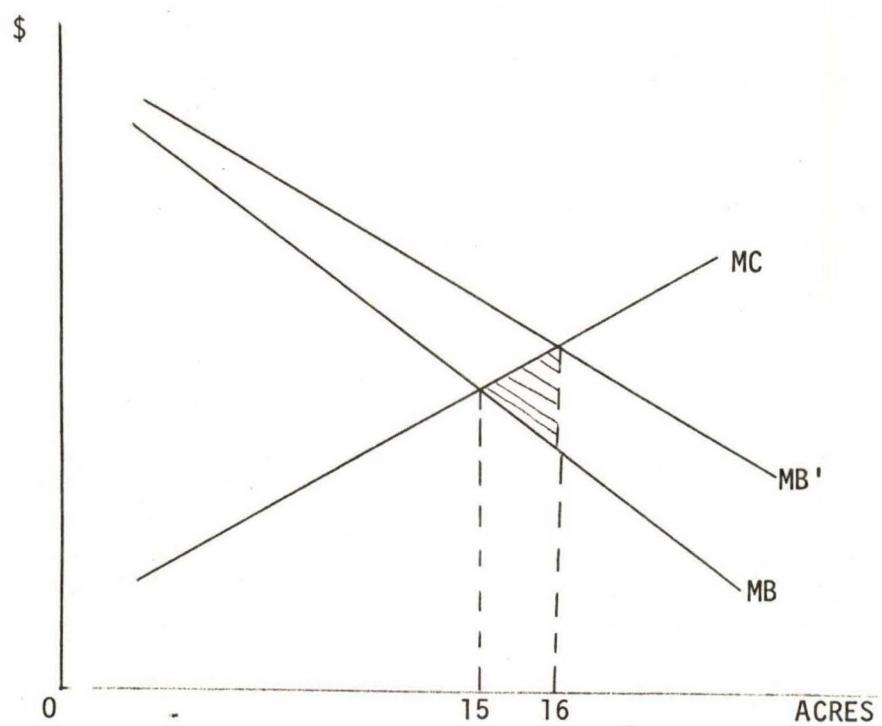


Figure VI-2: Allocations Modified by Distributive Equity Considerations

REFERENCES CITED

Dror, Yehezkel. 1968. Public policymaking reexamined. Chandler Publishing Company, San Francisco.